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Why You Should Modernize Now

What Operations to Consider

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FOOD ENGINEERING

FOR MANAGEMENT
IN MANUFACTURING,
PACKAGING, MARKETING

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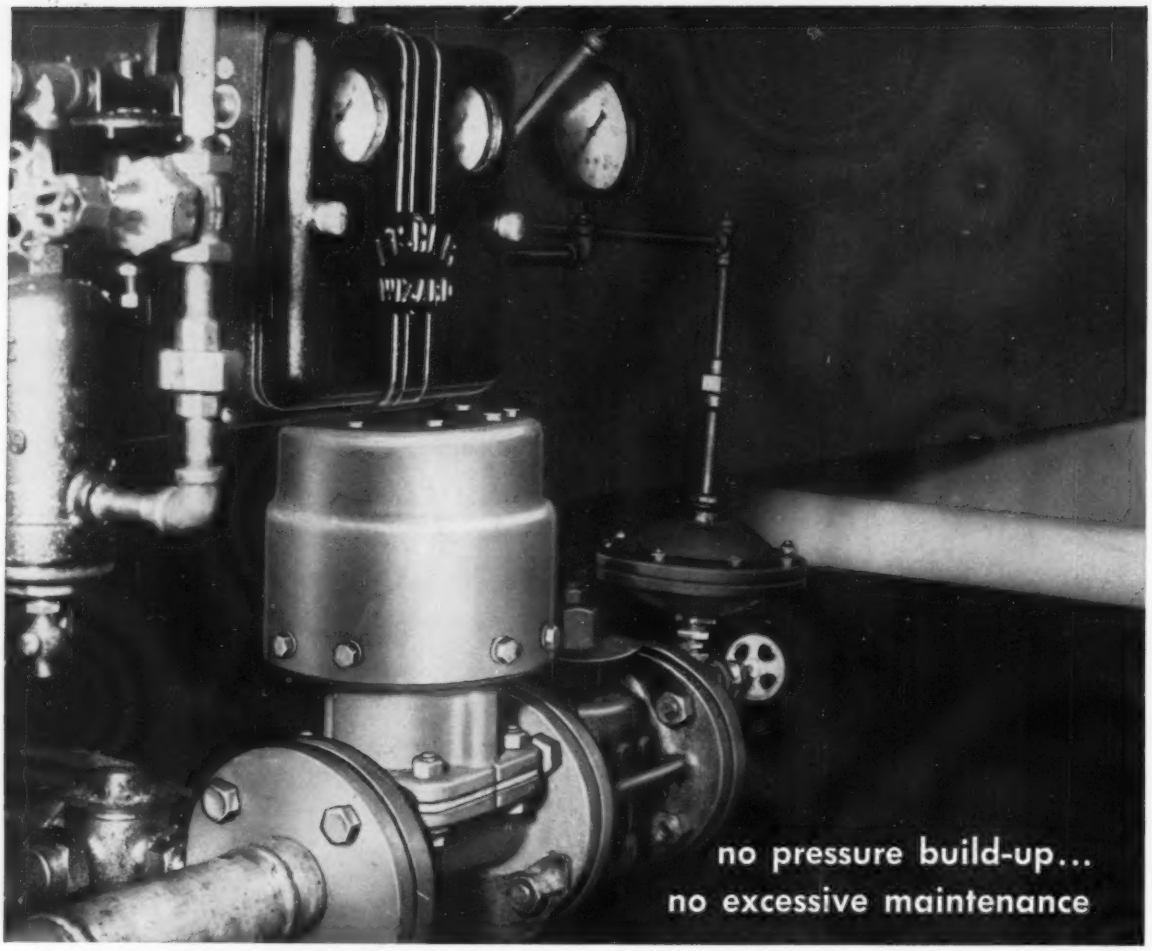
AUTOMATION
A Key to '59 Plans

PLAN '59

Modernize now for growth and profits

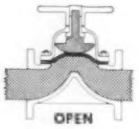
A SPECIAL REPORT FROM McGRAW-HILL TO AMERICA'S BUSINESS EXECUTIVES



POWER-OPERATED

GRINNELL-SAUNDERS DIAPHRAGM VALVES

At the Oakland, California plant of Sunshine Biscuits, Inc., basement storage tanks are used to stockpile syrup concentrate. The syrup is then pumped to processing units on floors above. ↑ ↑ ↑ To keep pressure from building up when some of these units are shut down, a portion of the syrup must be bypassed back to the storage tanks. The amount of syrup returned must be carefully controlled, in order to keep a constant pressure at units in operation. ↑ ↑ ↑ Power-operated Grinnell-Saunders Diaphragm Valves, equipped with pilot controls, were selected for this service. This combination precisely interprets physical pressure conditions in the main line to within 1% to 10% of controlled line pressure. Other reasons for the selection of Grinnell-Saunders Diaphragm Valves are:



Diaphragm lifts high for streamline flow in either direction. No irregular surface to trap deposits.

Diaphragm seals tight for positive closure, even when handling viscous or fibrous materials.

EASE OF MAINTENANCE — Because the diaphragm is the only part of the valve that ever needs replacement, maintenance is at a minimum. In the case of Sunshine, diaphragm replacement occurred only once in 7 years.

ISOLATION OF WORKING PARTS — The diaphragm completely isolates working parts, preventing clogging of valve mechanism by the syrup, as well as eliminating possible abrasion of working parts by syrup crystals.

NO PRODUCT CONTAMINATION — There are no pockets to trap syrup, eliminating the threat of product contamination.

POSITIVE CLOSURE — The diaphragm seals tightly against the valve weir for a positive closure, even when handling viscous or fibrous materials.

For details about Grinnell-Saunders Diaphragm Valves, their operation and service record, write Grinnell Company, Inc., Providence 1, R. I.

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
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FOOD ENGINEERING
FOR MANAGEMENT
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30th YEAR
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COVER PICTURE—Central control panel in J. Lyons & Co.'s new ice cream plant in London is advance over American practice.

where they really know Costs

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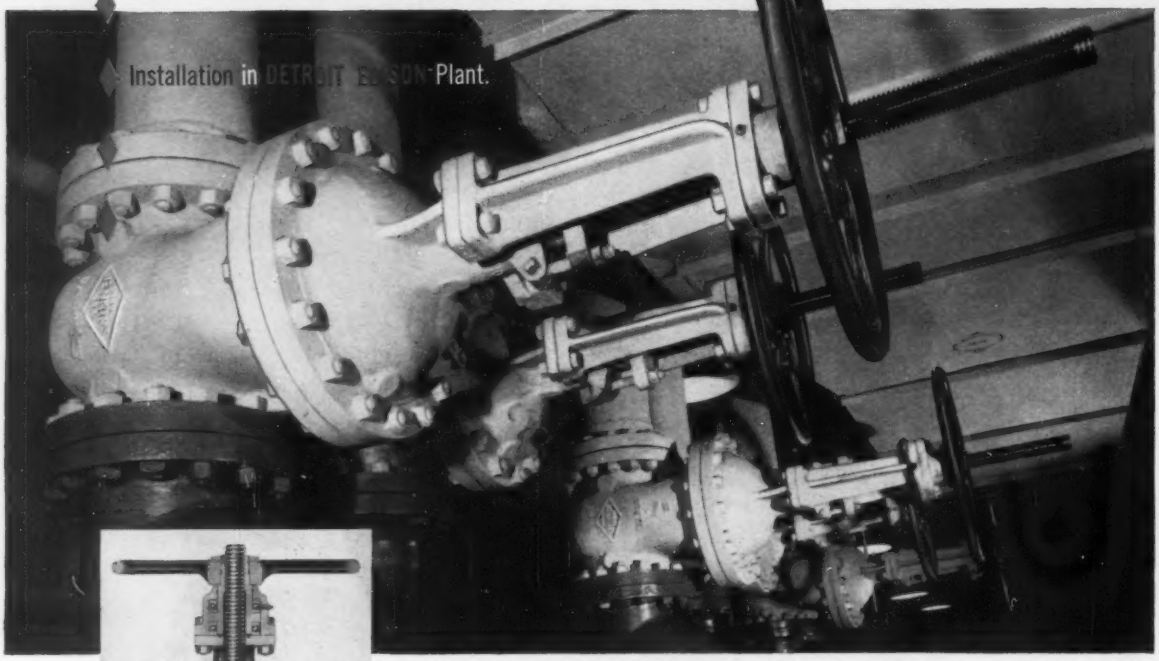

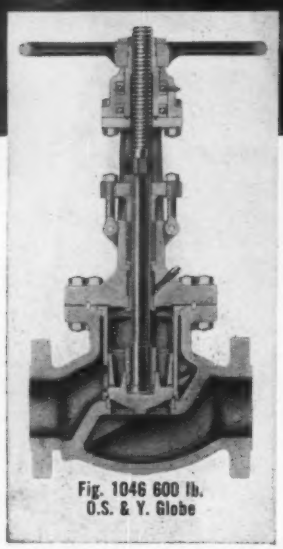

Fig. 1046 600 lb. O.S. & Y. Globe

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If *foam* has you down (and your processing too), try a Dow Corning SILICONE DEFOAMER. Get this costly menace off *your* back for good.

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1 oz kills foam in:

120,000 lb citrus fruit coloring solution
62,500 lb soya oil-hexane mixture
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My foamer is

Oil system

Aqueous system

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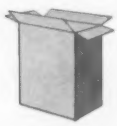
NEW! COST CUTTING CAN CASER

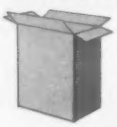
Because of its smaller flaps, the end-opening shipping case is easier to feed and quicker to position for a higher continuous operating speed, and is less fatiguing for the operator.

NON-SHOCK END-OPEN CASER



FOR SINGLE TIER LOADING

46 OZ. AND NO. 10 CANS



With end-opening shipping cases showing a savings of about 15% in fibre alone, no wonder packers using single tier patterns have welcomed FMC's development of this continuous, high speed, automatic caser. Employing many of the key design and construction features of the FMC Model 3 Caser for top-opening cases, this new machine easily handles 1200 cases per hour or more, limited only by the speed of the operator. Cans enter the machine upright, eliminating rolling can impact. As a result, there is no tearing of labels or scratching of lithography; no body dents or split seams. Although used largely for the more common can sizes cased in single tiers (46 oz. and No. 10 cans), the FMC Non-Shock End-Open Caser may also be built for single tier packs of smaller size cans. This machine is a truly remarkable achievement in the field of automatic casing equipment. Write today for complete information, or call your nearest FMC representative.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

Canning Machinery Division

General Sales Offices:

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TRENDS & FORECASTS

SPECIAL

FOOD ENGINEERING

SERVICE to EXECUTIVES

Food crop production is expected to break all previous records this year. USDA's all-crop index, based on 59 items, was up to 116 on Sept. 1, compared to a former high of 106 reached in three previous years.

Indicated gains over '57 are: vegetables for processing 12%; apples, 7%; peaches, 16%; corn, 5%; wheat, 53%; oats, 8%; peanuts, 24%; fall potatoes, 12%; eggs, 2%; sorghum grain, 3%; soybeans, 17%.

Meat animal production is increasing. Pig and lamb crops are larger than last year. Number of cattle is rising, and feeding is heavy.

Competition in dairy industry has become keener, say 88.8% of firms in DISA survey. Profit margins are slimmer for 80.6%; labor higher in proportion to all expense for 84.3%; supplies and equipment higher for 64.6%.

Frozen RSP cherry pack this year is 37% below '57, or 82,884,787 lb. Pack of canned RSP cherries is 24% less, or 2,746,314 cases.

Canned green pea pack for '58 is 12% less than in '57, totaling 33,110,010 cases. The asparagus pack is up 9.6% to 7,486,359 cases.

Tonnage of retail food store sales is 2 to 3% above last year. Dollar volume for second quarter of '58 was about 7% above '57.

Food manufacturers have produced more this year with about 1¼% fewer employees. Number of workers was just under 1.5 million in second quarter of '58. Hourly earnings in July were 9c. higher than a year earlier.

Grocery wholesalers' stocks at the beginning of July were lower than in '57. Retailers' inventories have been running 5% over last year.

Total food exports for January-May period were 15% lower than year ago, but shipments of manufactured food products rose substantially.

Consumption of canned soft drinks increased 13.4% in first half of '58, to 222,503,000 cans. Canned beer gained 1.2%, for 4,083,980,000 cans.

Imports of sweetened chocolate candy rose 16% in '57, to more than 7 million lb. The confections came largely from Holland and Britain.

Nut production is forecast 15% higher for peanuts, 27% for pecans, and 24% for the West Coast fall walnut crop, compared to last year.

Process Vegetables up 12%

Prospective '58 tonnage of eight important vegetables for processing is 12% above '57 production and 21% above average, according to the USDA Crop Reporting Board.

The indicated 1958 tonnage of these crops, based on Sept. 1 conditions, is 6.96 million tons. The eight crops account for about 92% of the total tonnage processed.

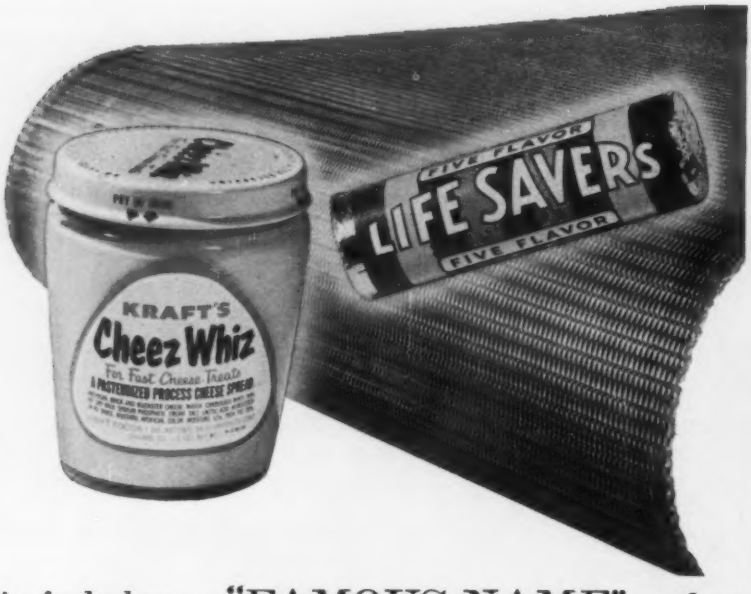
A total of 93,440 tons of green lima beans for processing is indicated. This is about 4% more than average and slightly larger than last year's crop.

Snap bean prospects declined slightly toward the end of the season, and a total of 368,140 tons was indicated for canning and freezing. This compares with 359,810 tons harvested in '57 and the average of 271,800 tons for the '47-'56 period.

Indications point to a total of 132,000 tons of beets for canning in 1958. This is about 19% less than the 163,600 tons of '57 and 9% below the 10-yr. average.

Production of cabbage from acre-

See Developments to Watch p. 13



in food plants... **"FAMOUS NAME"** *products ride on* **WISSCO BELTS**

Many prominent food companies solve costly, difficult processing problems by using Wissco Belts.

Kraft Foods Ltd., of Montreal, installed a Wissco Stainless Steel Belt and eliminated the loss (due to rust and corrosion) of two new belts each year. The Wissco Belt fulfilled their requirements for cleanliness, corrosion-resistance and long life.

Beech-Nut Life Savers, Inc., also uses Wissco Stainless Steel belting. The open mesh construction has ensured efficient cooling operations, and eliminated flavour-transference problems in their candy processing. Beech-Nut reports: "Absolutely no downtime due to belt repair or replacement, in 30 years of using Wissco Belts."

Yes, Wissco Stainless Steel Belts ensure cleanliness and long life, in food processing operations. Wissco's thin flat spiral construction reduces the major causes of belt trouble . . . stretch, distortion, and breakup. There is no excess wire to bend or stretch. Wissco's open mesh construction permits efficient circulation of air, ensures liquid runoff, assists heating and cooling effectiveness.

Wissco also provides belting in galvanized, carbon and alloy steels for specific applications.

For further details on Wissco Belts and their uses in food-processing applications, send us the coupon below . . . without obligation, of course.

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( ) Please send me, by return mail, your new folder on Wissco Belts for Food Plants.
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TITLE_____
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ADDRESS_____
CITY_____ ZONE_____ STATE_____

Trends & Forecasts

age under contract to kraut packers is now forecast at 130,300 tons, or 600 tons more than was expected on Aug. 1. Last year, kraut packers purchased 61,300 tons or 36% of their total supplies on the open market.

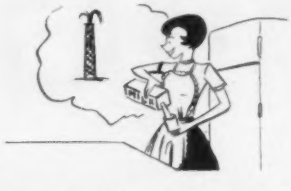
Sweet corn production prospects declined about 9% from the Aug. 1 forecast. On Sept. 1, a total of 1,325,400 tons was indicated for processing in '58. This is about 13% less than last year's production of 1,514,800 tons, and slightly below average.

On September 1, a total of 4,368,400 tons of tomatoes for processing was indicated for '58. This is nearly 3% more tonnage than was indicated on August 1, and 32% above last year's production.

The condition of cucumbers for pickles was better than in '57, and than average, on the corresponding date.

HORS D'OEUVRES

▶ **Prices ending in 9 are particularly attractive to shoppers, a chain store reports. Fine. Take a 27-cent item, add 2 cents more profit, and everybody will be happy.**



▶ **An Alaskan dairy prints oil-lease certificates on the sides of milk cartons. Twenty-five entitle you to a ten-thousandth interest in a genuine oil-producing area. New way to enrich milk.**

▶ In New Jersey you can phone your order to a supermarket, jump into your car, and pick up your food basket at a special drive-in window. Hot-rod merchandising we have yet.

▶ **Sprouting causes navy beans to develop vitamin C, 'tis reported. Had the Royal Navy known that, British limeys would be called "beanies."**

▶ Medical researchers are looking for the part of the brain that controls the appetite. If they find it, a surgeon will be able to cut your food bill.

▶ **Martinson has introduced a candy with the "real coffee" flavor for which the firm is famous. This could trigger a trend in new product ideas among food firms. Hope the limburger boys don't hear about it.**

Ralphs Supermarket reporting:

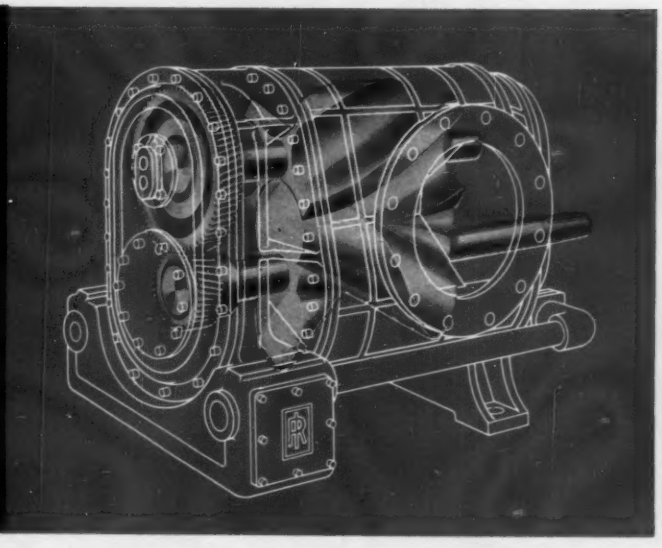
IN A CLASS BY ITSELF...

the Axi-compressor

Not Reciprocating...
Not Centrifugal...
It's an

AXIAL FLOW ROTARY COMPRESSOR

Capacity 100 12,000 cfm
Pressures to 15 psig
Vacuums to 15" Hg.



BECAUSE of its unique rotary design, the Ingersoll-Rand *Axi-compressor* delivers air or gas with less power in a smaller space than other types of compressor of equivalent capacity. It is equally suitable for pressure, vacuum or combination operation.

Utilizing the axial flow, positive displacement principle, the Axi-compressor discharges air smoothly and continuously, free from shocks. There are no pistons or valves, and the only moving parts are two perfectly balanced helical rotors which operate with minimum noise or vibration. The rotors never touch each other or the casing. Hence there's no need for internal lubrication.

Advantages:

- **Space-Saving, Compact Design** – can be installed on simple, low-cost foundations.
- **Clean, Oil-Free Air** – no danger of contamination from lubricants.
- **Smooth, Pulsation-Free Compression** – no bulky air receivers required.
- **Operates at Higher Motor Speeds** – can be direct driven without belts or gears.

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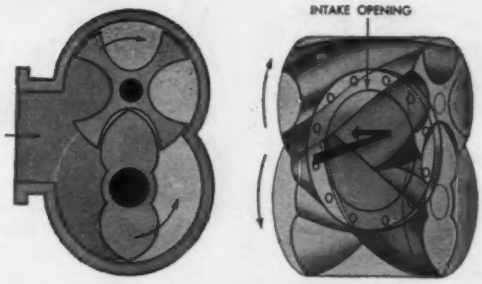
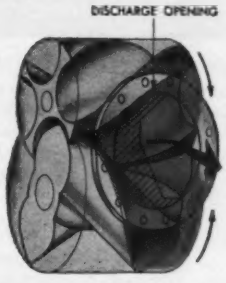
HERE'S HOW IT WORKS...



Intake: During the inlet cycle rotors are turning away from each other, drawing air or gas into the inlet space. This gas is then moved around to the discharge side of the compressor.



Compression and Discharge: During the discharge cycle the rotors are turning toward each other. They displace the inlet volume and air is smoothly compressed and forced axially toward the discharge opening.

PUMPS • CENTRIFUGAL & RECIPROCATING COMPRESSORS • DIESEL ENGINES • AIR & ELECTRIC TOOLS • TURBO BLOWERS • STEAM CONDENSERS

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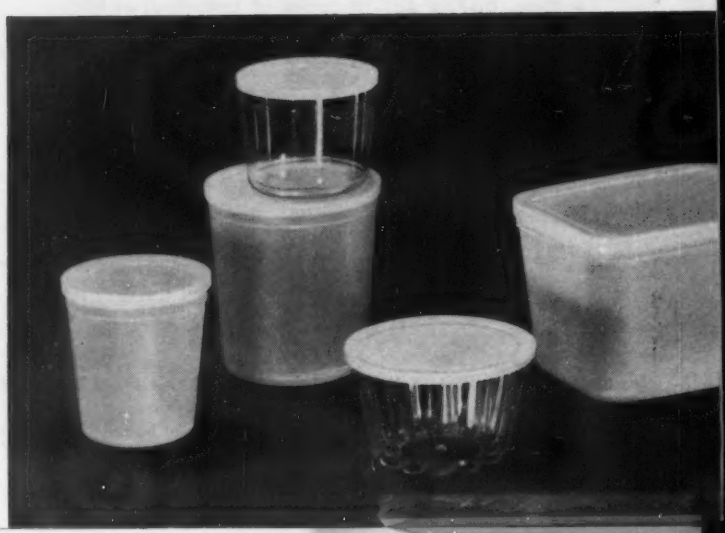
Ralphs Supermarket reporting:

"Molded Plastic containers boosted our packaged salad sales many times."

Mr. Maurice Heard, Asst. Store Manager, Ralphs Supermarket, Gardena, California, with a few of the XLNT Spanish Food Company products packaged in CRYSTAL PACK PLASTIC CONTAINERS molded by Mutual Plastic Mold Corporation, South Gate, California.

Displayed here are a few packages from the hundreds of colors, sizes, and shapes available for food packaging with molded plastics packaging. These packages are produced by Mutual Plastic Mold Corporation, South Gate, California, one of the nation's leading creators of molded plastics packaging.

Mutual offers 18 different stock plastic containers, from 6 ounce to half gallon. In the food field, these containers are used for salads, puddings, honey, ice cream, sherbets, candies, meat and cheese spreads, and hundreds of other items.



Since Ralphs (the largest local food chain in Southern California) switched to molded plastic containers for delicatessen-type salads and foods, four years ago, sales have increased many times over their former level.

"We carry a wide variety of items packaged in these containers. The containers not only stack well—but the mold shapes that package and contour the gelatin salads make colorful and exciting displays, as the vivid reds, cool greens, and deep purples of the gelatin show through and catch the shopper's eye. It's small wonder they outsell conventionally packaged salads '20 to 1'."

Package molders can offer invaluable assistance in designing and producing effective packaging for "help-yourself" markets. They have long experience in visual merchandising. Their design services are both imaginative and practical. Their productive facilities supply molded packages by the hundreds or millions, in the right size, shape, strength, and at the right cost.

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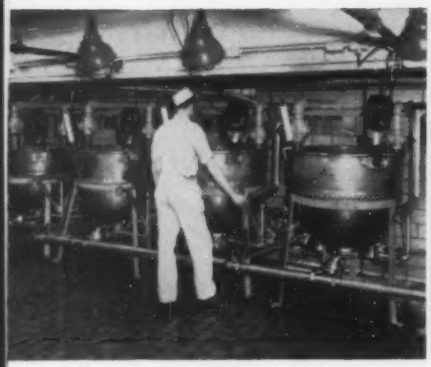
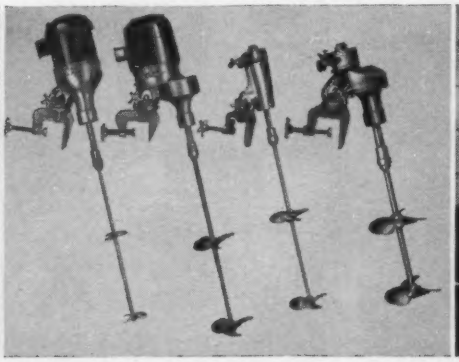
*City*_____ *State*_____

How to choose a portable mixer

To get your money's worth, ask yourself these questions



1. Will it mix my materials efficiently? There's one easy way to be sure your mixer will combine fluid flow and turbulence in optimum proportions for good mixing. Specify a LIGHTNIN Portable Mixer! Every LIGHTNIN is guaranteed—unconditionally—to do the job right.

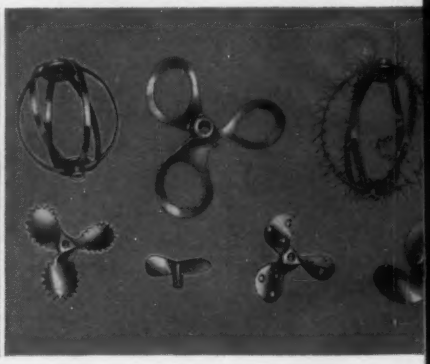


2. How much choice do I have? With LIGHTNINS, you can choose from *thirty* standard portables, ⅛ to 3 HP. Your choice of direct or gear drive; electric or air motor. Shafts and propellers in all alloys and coverings. Whatever the job, there's a LIGHTNIN to handle it.

3. Is the motor right for my conditions? You're assured of correct motor application if you specify LIGHTNINS. All enclosures (open, totally enclosed, Class 1, Group D, explosion-proof) and all standard current specifications—and many non-standards—are carried in stock.

4. How is the shaft supported? Is the mixer built to protect the motor against the strain of radial shaft loads? You'll find this vital safeguard in LIGHTNINS. An extra ball bearing here steadies the shaft for true running—protects the motor from radial shaft loads.

5. What about adjustability? You can quickly swing a LIGHTNIN Portable to any angle for the exact kind of mixing you want—slow roll, vortex, or rapid top-to-bottom turnover. Universal ball-and-socket clamp tightens without wrenches—stays tight.



6. Can I meet special requirements with it? You get widest latitude for matching *any* need with LIGHTNINS. Full range of propeller designs for any special or unusual mixing job; alternative mountings for permanent or semi-permanent use.

7. Where can I get prompt service on fluid mixing? Just call your LIGHTNIN Mixer representative. He can quickly give you a *guaranteed* recommendation. And he's near you—look him up in Thomas' Register or the yellow section of your telephone directory. Or write us direct.

WHAT SIZE AND TYPE of mixer do you need? Check here for latest bulletins giving full description, packed with helpful facts on mixing:

- ☐ Turbine, paddle, propeller types; top or bottom entering: 1 to 500 HP (B-102)
- ☐ Propeller types; top entering: ¼ to 3 HP (B-103)
- ☐ Portable: ⅛ to 3 HP (B-108)
- ☐ Side entering: 1 to 25 HP (B-104)
- ☐ Laboratory and small-batch production types (B-112)
- ☐ Condensed catalog showing all types (B-109)
- ☐ Quick-change rotary mechanical seals for pressure and vacuum mixing (B-111)
- ☐ Data sheet for figuring mixer requirements (B-107)

Check, clip, and mail with your name, title, company address to:

MIXING EQUIPMENT Co., Inc., 143-K Mt. Read Blvd., Rochester 3, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.

Lightnin® Mixers

MIXCO fluid mixing specialists

DEVELOPMENTS TO WATCH

SPECIAL
FOOD
ENGINEERING
SERVICE to
EXECUTIVES

"Jelling" a martini and thickening water demonstrate unusual properties of new non-toxic stabilizer and emulsifier. A water-soluble carboxy-vinyl polymer developed by B. F. Goodrich Co., it is useful in foods. "Carbopol" will be submitted for FDA approval.

Number and thickness of slices to make a pound when cut from bacon slab are determined automatically by slicer control developed by Swift. Aim is to eliminate addition or removal of slices to correct package weight.

X-ray inspection on television-type screen, 10,000 times brighter than conventional fluoroscope, now is possible at locations up to 1,400 ft. remote. Secret is GE image intensification system. Image may be magnified 3X. Viewing can be under light, rather than in darkened area.

Undersize product fines removed by screening may be compacted into sheets and granulated to proper size. This is achieved with new continuous Allis-Chalmers process. Food applications are under study.

Seven of ten leading causes of death and crippling diseases are associated with obesity, says Nutrition Foundation's Dr. C. G. King. And about 25% of the nation's population is sufficiently overweight, from excess stored body fat, to influence health negatively. Too many calories.

Particle-size measurement fast enough for in-stream control of size-reduction machines is achieved with new instrument. Particles in fluid suspension pass electrodes in small aperture, producing electrical pulses.

Mylar-laminated shipping cases that are washable and have long life are being used by National Brewing Co., Baltimore.

Portion-control cut frozen fish rolls are being developed by Gortons.

Frozen mashed potato portions, about half as large as thumb, are made for airlines by Simplot. Steaming 4 min. readies for serving. Holding time is 2½ hr. Cost is but 2c. per serving.

Capsule-size mercury switch for sensitive, trouble-free operation in dusty or moist places has been developed by Minneapolis-Honeywell. With a 0.174-in. dia. and 0.93-in. length, switch fits tight spaces.

Shippers and repackers of mature-green tomatoes can reduce costs as much as $263 and $108 per carload respectively, by using fiberboard dual-purpose containers, according to USDA. Savings take into account cost of container, packing, loading, and repacking.

See Washington Report p. 21

New convenience-packaging opportunities for pre-cooked vegetable products are offered by low-cost boilable bag made of plastic-lined paper.

Instant egg coffee in on the market. Frozen fresh eggs are blended in by new process "to bring out the smooth, rich flavor."

Aluminum foil now can be welded continuously by ultrasonic unit that produces molecular transference between two pieces of metal. Weld is stronger than foil. Airtight-package applications are seen.

SEE NEXT PAGE ➔

OVERHEATING DAMAGE

melts processing profits!

FULTON SYLPHON

SAFETY TYPE

TEMPERATURE REGULATOR

Don't risk costly damage to products in process . . . or injury to personnel. Install a SAFETY TYPE Fulton Sylphon No.1006 Series Temperature Regulator. Control valve automatically *closes* to prevent overheating if thermostatic charge is lost due to accidental damage to the unit. Self powered. Large two-ply seamless Sylphon® Bellows assures sensitivity and extra power over an extended life. Teflon chevron valve stem packing prevents sticking . . . assures smoother control . . . requires no lubrication. Sizes from ¼" through 4". Whatever your process, check up on this safety "insurance" now. Write for Bulletin D-TG.

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Robertshaw-Fulton CONTROLS COMPANY

FULTON SYLPHON DIVISION • Knoxville 1, Tenn.

Developments to Watch

Big-Promise H-A Corn Nearer

Is that long-conjectured high-amylose corn due to get "onto the calendar"? Researchers say it is, now judging that continued plugging for optimum hybrid strains eventually will turn the trick.

Benefits would be a whole new group of highly useful products, giving the corn processing field a big lift. Along with it would come a happy reduction in corn surpluses.

Found in small ratio in present corn, amylose bears a molecular resemblance to high-utility cellulose. And in sufficient yield it well might become as useful.

An excellent packaging film can be made of amylose acetate. Most striking, it's digestible (unlike cellulose acetate), hence can be eaten along with the food it protects. Such an edible wrap has already been called for to package food for space men (see FE Sept., p. 49). And possible starch uses of amylose are myriad.

Pesticide Residue Checks Sped

Determining the amount of pesticide left on harvested leafy, green vegtables is seen taking less than 2 hr. using a gas chromatography technique developed at Stanford Research Institute.

With current methods it's very difficult to gage the residue unless the pesticide is known—information often lacking due to constant introduction of new agents. Thus, separate checking procedures have been involved.

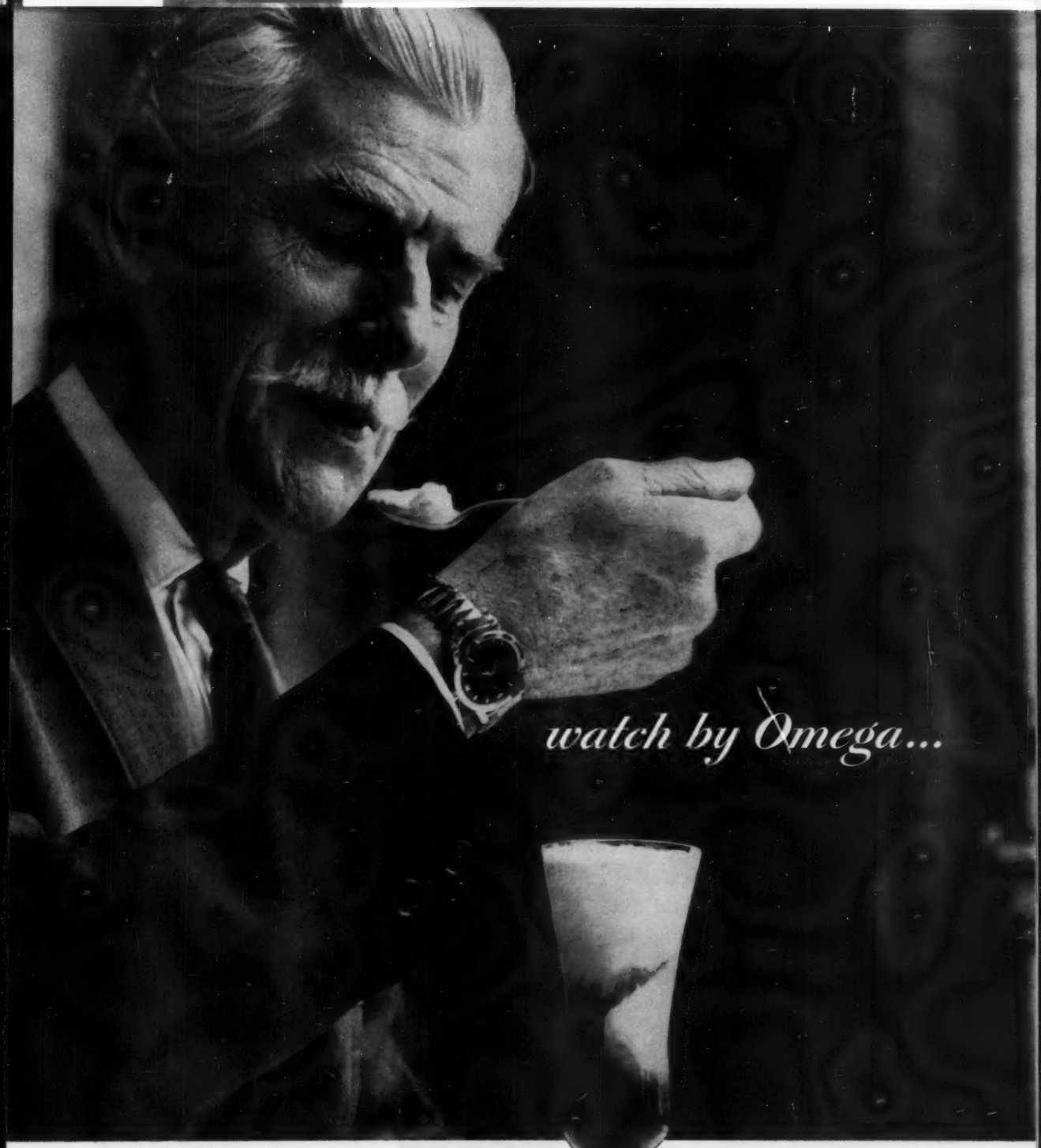
This situation led SRI to experment with the chromatography method—a single, rapid procedure.

Here, complex mixtures are "broken down" in passage through

Seen "zeroing in" on a pesticide residue is Dr. D. Coulson of SRI. It was under his direction that new gas chromatography residue-spotting was developed.

For more data, circle 254 on Reader Service Card

For more data, circle 255 on Reader Service Card



...flavor by Webb

If your customers are quality minded (and whose aren't!) you'll have an added edge when you use food flavors by Webb—outstanding for trueness, delicacy, uniformity and strength. Specialists in standard flavors and custom flavor development for over fifty years. Inquiries invited. Catalog on request.

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MAIN OFFICE: COS COB, CONNECTICUT • BRANCHES: CHICAGO AND LOS ANGELES

Developments to Watch

How new LINK-BELT screw conveyor components

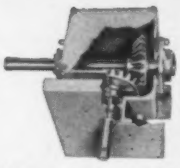
reduce power demands and maintenance delays

BALL BEARING HANGER has self-aligning bearing and seal—adjusts to suit shaft deflection. Square tube member of frame is positioned to permit easy passage of materials.

QUIK-LINK CONVEYOR SCREW. For ease in removal of conveyor section without dismantling other components. Feature can be furnished on Helicoid and Sectional Flight Conveyors.

TROUGH END SEAL assembled between flange block and trough end plate, keeps grease in, dirt out. Used with lip, felt or waste packing seal to prevent bearing-product contact.

DOUBLE BALL BEARING Flange Block employs two Link-Belt precision ball bearings spaced to withstand overhung load at drive end and take thrust loads of screw in either direction.



BALL AND ROLLER BEARING COUNTERSHAFT END. For drives at right angles to screw conveyor or common drive for two conveyors intersecting at right angles—absorbs thrust.

Complete line of accessories can be installed on new or existing systems

THOUGH just recently introduced, these Link-Belt screw conveyor components have already achieved a wide acceptance. Throughout industry, they're cutting power and maintenance demands to a new low.

Design refinements include the Quik-Link conveyor screw that makes removal of conveyor section possible without dismantling other components. Starting and running friction is reduced through the use of Link-Belt ball bearing hangers, as well as new ball bearing trough ends. Trough ends can be furnished with seals to protect bearings—seals are rabbetted for perfect bearing alignment.

For facts, call your nearby Link-Belt office or authorized stock-carrying distributor. Or write for Folder 2489.

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.

LINK-BELT

14,782

SCREW CONVEYORS

a heated separating column, which comprises a tube packed with a material that allows each chemical to pass at a characteristic rate. An inert gas (such as nitrogen or helium) flows through tube as "carrier."

Volatilizing time is key to specific chemical. Identification is through reference to characteristic patterns established for various pesticides, while concentration is found by measuring amount of pesticide leaving the tube.

Already, effective separation of lindane, aldrin, dieldrin, and DDT are reported. Now sought is a sharper sensitivity for spotting concentrations as low as 1 ppm.

USSR Trawlers Outstripping Us

Pointing to its lead in world fish production—accounting for some 17% of the total—Japan now goes on to say that the Soviet Union has nosed out the U. S. for second place.

This may be but a broad evaluation of the global standings. However, our National Fisheries Institute has checked the statement with the Bureau of Fisheries, and it is indicated that actual hauls, and not mere talk, are behind the report of Russia's upsurge.

Schedule of Events

October

19-21—Brewers' Assn. of America, annual convention & exhibit; Edgewater Beach Hotel, Chicago.

19-22—Controllers Institute of America, annual conference; Chalfonte-Haddon Hall, Atlantic City.

20-22—American Oil Chemists' Society, annual fall meeting; Hotel Sherman, Chicago.

21-24—American Dietetic Assn., annual meeting & exhibit; Trade & Convention Center, Philadelphia.

22-24—National Pickle Packers Assn., convention & exhibit; Edgewater Beach Hotel, Chicago.

25-29—American Bakers Assn., annual meeting; Hotel Sherman, Chicago.

26-29—National Frozen Food Distributors Assn., National Prepared Frozen Food Processors Assn., joint merchandising convention & exhibit; Hotel Statler, New York City.

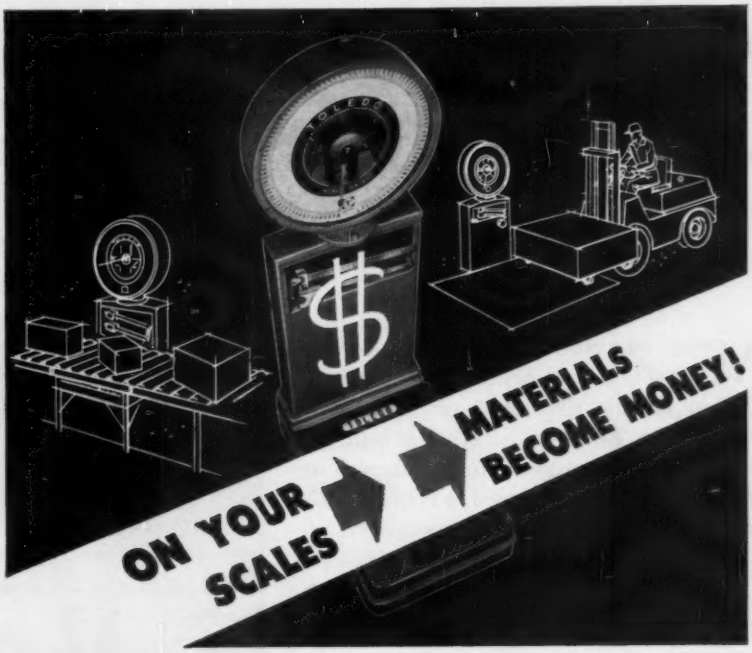
November

3-6—Institute of Sanitation Management, annual sanitation maintenance exhibit; Trade Show Bldg., New York.

10-12—Grocery Mfrs. of America, annual meeting; Waldorf, New York City.

17-20—American Bottlers of Carbonated Beverages, annual convention & exhibit; Convention Hall, Atlantic City.

17-21—Master Brewers Assn. of America, annual convention; Hotels Fontainbleau & Eden Roc, Miami Beach, Fla.

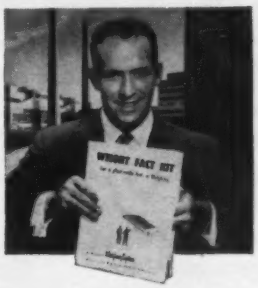


It will pay you to check now

on weighing efficiency in your plant!

For proper cost control, efficient weighing is a prime requirement. Weight records directly affect costs, quality, inventory control and customer billing. You can avoid weighing errors and inadequate weight data by placing the right scales in the right places . . . all properly integrated in a *plant-wide weighing system* to supply basic accounting records on materials received, transferred and shipped.

You can easily check up on the job your scales are now doing. Just ask for the exclusive Toledo Weight Fact Kit. A Toledoman will gladly explain how it will help you detect and correct weighing inefficiencies in your plant. REQUEST YOUR WEIGHT FACT KIT NOW. No obligation. Address Toledo Scale, 1404 Telegraph Rd., Toledo 12, Ohio.



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DIVISION OF TOLEDO SCALE CORPORATION

SERVICE Factory-Trained 200 Cities

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REMOTE DIGITAL WEIGHT RECORDING

For more data, circle 257 on Reader Service Card

Here is flexible "ZONE CONTROL" with **Jeffrey Dryers and Coolers**

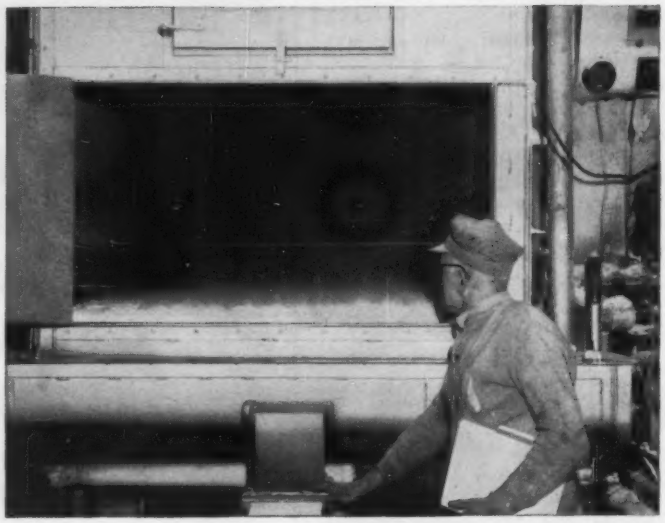
WHETHER YOUR cooling and drying problems are simple or complex—Jeffrey electric vibrating equipment will solve them. Each installation is built of standard, pre-engineered units, adapted to the particular job, designed to help produce quality products. Sections may operate at different air temperatures, velocities and conveying speeds, giving "Zone Control" in each individual step in the system.

Sectionalization permits intermediate operations—mixing, scalping, crushing. Flexible arrangement in straight line or U-shape meets all space requirements. Food products are dried or cooled in minutes instead of hours.

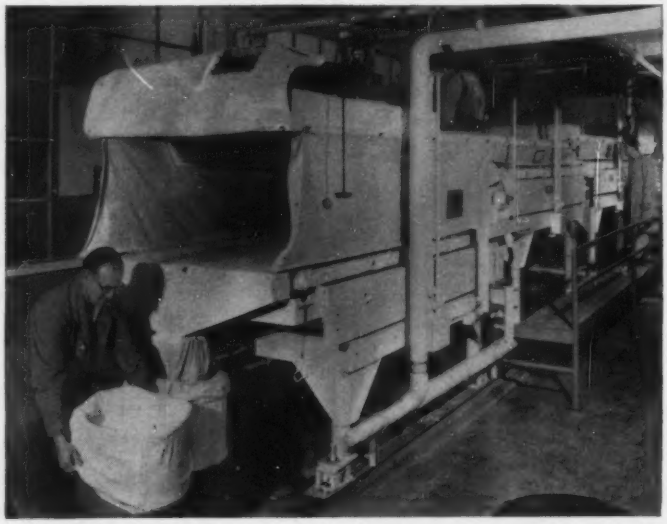
Our laboratories are available to customers for tests free of charge. Pilot-size test-units available for testing under production conditions in a customer's plant. Inquire about laboratory facilities or field-test rental service. The Jeffrey Manufacturing Company, 835 North Fourth Street, Columbus 16, Ohio.

CHECK THESE PROCESSING ADVANTAGES

- Easy to install, inspect, clean.
- Gentle action prevents degradation; no structural vibration.
- Slight suspension (direct air type) produces fluffing, fluidizing action.
- Sectionalization gives complete "Zone Control."
- Easy servicing; minimum power consumption.
- Factory wiring eliminates on-job work.
- Units available with electrical or mechanical vibrating drives.



Salt actually floats in the air as the Jeffrey vibrating conveyor propels it through the dryer, drying it to .02% moisture content.



Jeffrey dryer of three units in line prepares bulk powdered Sucaryl by gently conveying it along the heated plate conveyor.

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

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RESEARCH
OF DEPTH AND IMAGINATION
Working in the favorable atmosphere of pure research and practical application, Firmenich has made imaginative and substantial contributions to the field of flavor. By isolation, identification and synthetization, precise and potent flavors, possessing all the desirable organoleptic qualities of the originals, have been achieved. By new and exclusive techniques, these materials are now also available in powder form to give further application in flavoring. The depth of Firmenich research is evidenced in the award of the Nobel Prize and four medals administered by the American Chemical Society. The originality of Firmenich research has been shared with fellow scientists in more than 300 technical papers. Firmenich technicians are highly qualified to assist you in the use of Firmenich flavors in developing new products, in giving fresh appeal to those long established.
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NEW CHEVROLET TRUCKS FOR '59!

New Might! New Models! New Money-Saving Power!

Task-Force 59 brings you more to work and save with in every weight class—more models, thriftier engines, stronger cabs and frames, safer brakes, tougher axles and transmissions! Here's the longest, strongest line of Chevrolet trucks ever built, the best yet of the best sellers!

Good news in the light-duty class! Chevy's longer, stronger '59 line gives you a *dozen* big pickups to choose from . . . new 4-wheel drive models, newly fashioned panels, Step-Vans, and Sedan Deliveries! Scores of innovations include new hard-pulling Positraction rear axle, new bigger brakes, new stronger cabs, new broad-shouldered styling refinements!

Bright new middleweight and heavyweight might! New big-tonnage L.C.F. and conventional trucks are heftier than ever with new 5-speed transmissions, new huskier clutches, more durable rear axles in capacities as high as 18,000 lbs.! G.V.W.'s go up to 36,000 lbs. in tandems . . . and up to 21,000 lbs. in new Series 50H and 60H models with heavy-duty components!

New thriftier 6's, all-new V8 power! Chevy's best selling 6's are set to pinch pennies like never before with new camshaft design, new valve train durability! *Six* modern V8's are tougher built for bigger savings; an all-new V8, the 185-h.p. Workmaster Special* with advanced Wedge-Head design, is offered in Series 70 and 80! See 'em for yourself—the bright new trucks of Task-Force 59 at your dealer's now! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**Optional at extra cost.*

CHEVROLET

CHEVROLET TASK-FORCE 59 TRUCKS

For more data, circle 260 on Reader Service Card

RR Shipping Will Cost You More

Food shippers can expect to pay higher rail freight rates soon as a result of the Interstate Commerce Commission's final ruling on the railroads' boost-bid of last December.

At that time, the roads asked rate and service charge hikes of $220,400,000 annually. ICC responded in February by allowing temporary increases of $191,500,000 a year. And now, in its final decision, it has authorized another $12,000,000 in rail charges.

Railroads can slap on the new rates with a mere 5-days' notice. However, there are indications that they won't apply all of the increases.

The raises authorized include: A jump of 6c. per 100 lb. in line-haul rates for shipments destined for further movement by water . . . A 10% charge on diversion and reconsignment . . . A 10% levy for stopping to partially load or unload . . . A new $2.86 and $4.09 loading and unloading charge (depending on service rendered) at Philadelphia and New York for foods other than those that are frozen, with option to raise similar service charges at other points to this level.

ICC refused to go along with the railroads on their request that free time at ports be cut to 4 days. It now averages about 7 days.

Further, the Commission ordered refund to shippers of some $10 million now considered excessive in the total rung up by the roads as a result of last February's temporary boost. Included here is a $1 million-plus refund to shippers of livestock.

Naming Humane-Slaughter Advisors

First move to implement the new Humane Slaughter Law (FE Sept., p. 23) was USDA Secretary Benson's call, last month, for nominations of qualified persons to serve on the 12-member advisory committee.

More than a score of organizations were specifically contacted for direct submissions of names.

The law specifies that the advisory group—to aid the Secretary with suggestions and recommendations—represent organizations of slaughterers, union interests in the packing-house sphere, the general public, livestock growers, the poultry field, organizations of the humane movement, professional veterinary organizations, and persons familiar with religious slaughtering.

Slaughterers, livestock growers, and humane groups would have two representatives each, the others one each.

USDA is to designate humane slaughtering methods by Mar. 1, 1959, and the packers must apply the practices by July 1, 1960. The law concerns only packers selling to the Federal Government.

Lawmen Seek Fast Residue Detection

Means for quickly determining pesticide-residue contamination of fruits and vegetables is getting special attention from the Assn. of Official Agricultural Chemists, now meeting in Washington.

This group of enforcement-agency and private-industry scientists particularly aims for a detecting technique that is both rapid and accurate, for this would go far in easing law enforcement relative to chemical tolerance levels as established by FDA. (Also see item p. 14)

Included on the agenda is an FDA report comparing foods packed before and after the first atomic explosion in 1945—expected to show whether radioactivity has risen in recent samples.

A-Bomb Vulnerability—and What to Do

Specific food-field operations considered by geographical concentration to be vulnerable in event of enemy attack are: Meat packing, wheat flour, cane sugar and corn refining, yeast, dextran, and cold-storage facilities.

So points out USDA Under-Secretary True D. Morse, who cites a map-plotting of some 500 food-industry facilities in 70 critical U. S. target areas.

National preparedness, he says, calls for special planning by food companies. Continuity of management and production must be insured, hence education and training programs are vital.

Key points on the checklist: Possible need for selection and equipment of alternate headquarters, safe keeping of process data and records, assessment of emergency shut-down and fire-fighting routines, and consideration of alternate sources of power.

Stand-by plans are particularly required, since the solving of local food problems would have to begin immediately following an attack, without waiting for restoration of communications.

Relative to the major aspect of plant dispersal to reduce vulnerability, Federal assistance is available for evaluating moves to new areas.

The National Plan for Civil Defense & Defense Mobilization is soon to be available (from Office of Civil & Defense Mobilization). Food managements, says Mr. Morse, should obtain it, study it, and keep it at hand against a possible emergency.

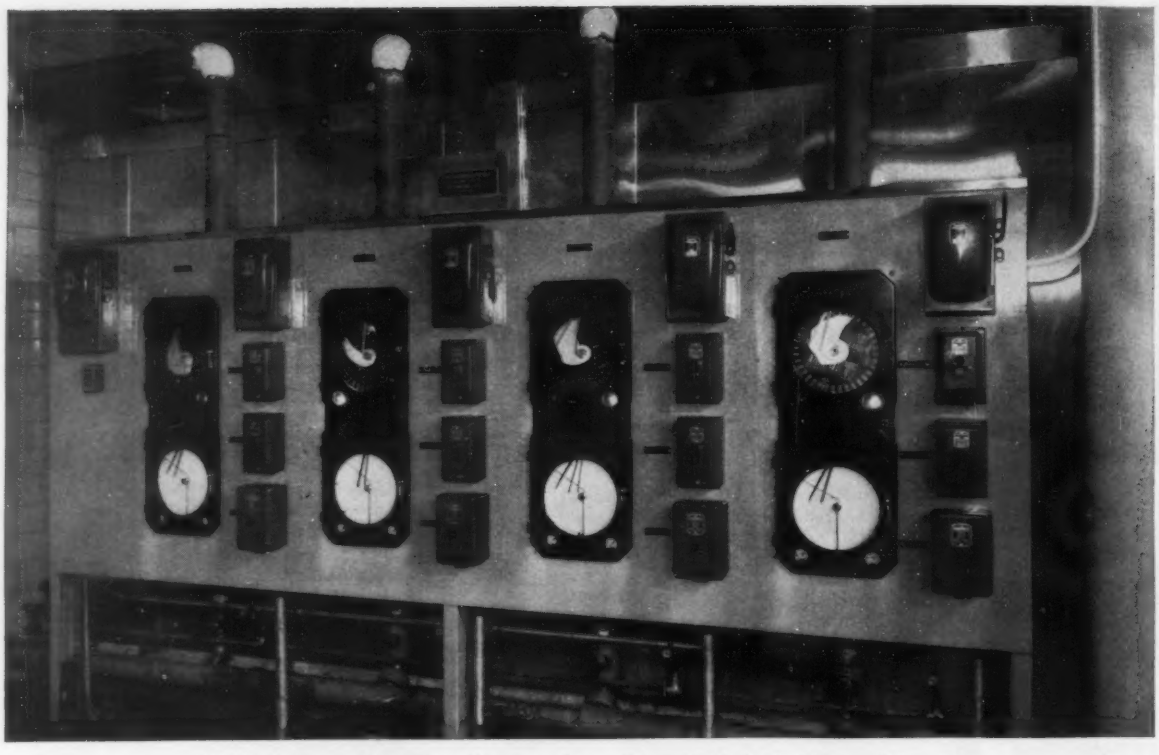
BRIEFS

Macaroni & noodle trade-practices rules have been issued by FTC. Called for is formation of a representative cooperating committee from the field.

No vitamin C nutritional value is carried by the antioxidant d-isoascorbic acid. To avert possible misleading of food buyers due to "ascorbic" part of name, FDA has now ruled that designation erythorbic (per d-erythorascorbic) acid is to be substituted in future food labeling.

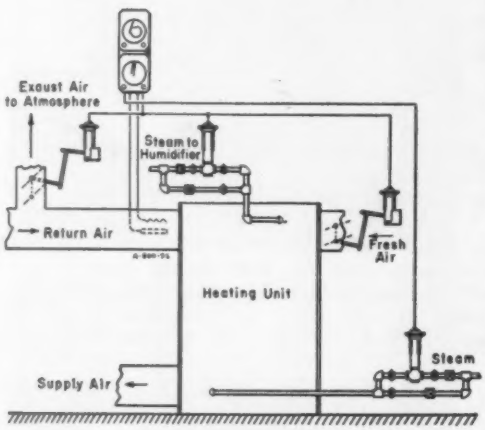
Bird people recently sat with USDA'ers in eight cities for special Q-and-A sessions on Federal poultry inspection, required Jan. 1. Weighed were possible regulation changes, rules on record keeping, and import factors.

Fees for new pesticide tolerance approvals have been boosted 150%. Old levies says FDA, fell far short of covering its careful checking of pesticide makers' scientific data relative to residues in foods. Since '54, FDA has Okayed some 1,500 tolerances or exemptions at upwards of $2,500 a throw.



Taylor Instruments control smoking, steaming and showering in bank of four smokehouses.

"TAYLOR CONTROLLED ATMOS SMOKEHOUSES INCREASE YIELD 8%" *says* FAMOUS CANADIAN PACKER



Mr. J. Ralph Bourassa, president (shown at right with his son J. Ralph, Jr., vice president and manager) of Noe Bourassa Ltd., Canada's oldest meat processing firm, reports that the Taylor Control Systems on their new Atmos smokehouses have increased yield up to 8% on some products. Noe Bourassa Ltd. is so pleased with this system that it is planning to install two new units with the same instrumentation, increasing their capacity by 50%.

Chances are there is a cost-cutting Taylor Control System for your process, too. Ask your Taylor Field Engineer, or write Taylor Instrument Companies, Rochester 1, N.Y., or Toronto, Ontario.

Push-button Automatic Smokehouse Control System regulates both wet and dry bulb temperatures within the smokehouse. After an optimum schedule has been determined, a cam is cut to conform with the schedule, and installed in the controller. Pushing the button starts the cycle: the cam control brings smokehouse temperatures up, maintains the desired number of hold periods, and shuts off according to schedule.

Taylor ***INSTRUMENTS MEAN ACCURACY FIRST***

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Canco's nationwide study of the summer market for Juices and Juice Drinks

Fruit Juices
Vegetable Juices
Fruit Juice Drinks
SUMMER SERVINGS
in Urban American Homes
A NATION-WIDE MARKET STUDY BASED ON FAMILY INTERVIEWS
CONDUCTED BY W. A. WALLACH RESEARCH, INC.
Prepared by the CANCO Marketing Division
AMERICAN CAN COMPANY
100 Park Avenue, New York

—the only single source to cover the total market for *all* juices and non-carbonated drinks!

In this 28-page report you will find all the vital data needed to plan your future marketing strategy, including:

- **size and nature of market**
- **types and uses of juices and drinks served**
- **when served and by whom**
- **principal forms and flavors**

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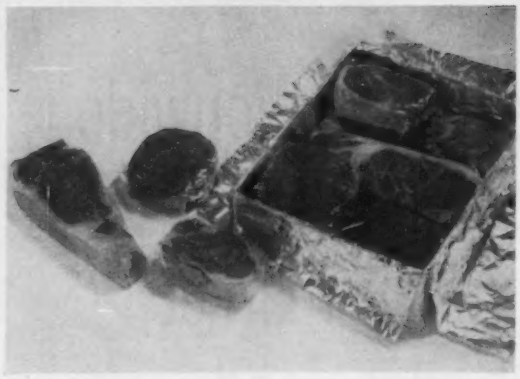
FE-10-58

NEW PACKAGES & PRODUCTS

Bottle Wins "Service Stripe"

During its more than 100 years of operation, Pabst Brewing Company has redesigned the neck band and label on bottles of its beer several times. Foundation for the now famous "Blue Ribbon" designation was laid in 1882 when actual blue ribbons were attached by hand to the neck bands.

Now the brewer is announcing a newer and brighter main label and the return of blue ribbons of foil to the neck band of its bottled beer. The eye-catching new central label is bisected by a brilliant scarlet band. The red bar has been added to the label as a "Service Stripe" to commemorate Pabst's 100-millionth barrel celebrated this 114th year of Pabst's history.



DeLuxe Meat Sampler

A sampler package of U.S. Prime Quality Meat is being offered to the consumer for the first time by Pfaelzer Bros. Inc., Chicago. Called the Blue Ribbon Sampler the package contains four filet mignons (1¼ in. thick, 6 oz. each), two boneless strip steaks (1¼ in. thick, 12 oz. each), and four chopped tenderloin steaks (1¼ in. thick, 8 oz. each).

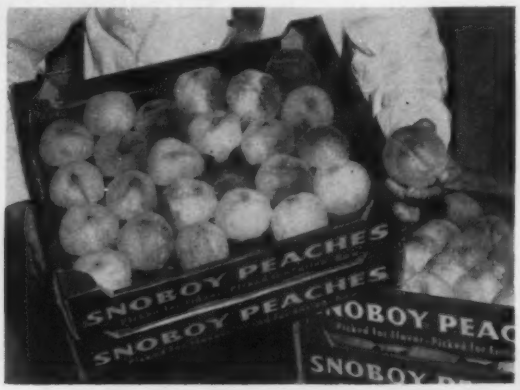
Steaks are individually wrapped in freezer celophane and packed in uniform moisture-proof polyethylene and foil lined cartons which are fully labeled for easy identification in the freezer. Steaks are scientifically dry aged to enhance flavor while increasing tenderness and reducing shrinkage in cooking.

New Italian-Style Frozen Macaroni

Macaroni au gratin is the newest pre-cooked quick frozen food product to come from Buitoni Foods. The tasty heat-and-serve dish is made with macaroni creamed in Parmesan cheese and fresh butter.

The 9-oz. package is heated in 25 min in its aluminum container, or the consumer can warm it in a sauce pan.

The appealing aquamarine package features a full color illustration on the face. One side shows the Buitoni trademark while the other displays the maps of Italy against a turquoise background.



Super Protection For Peaches

Ultimate in protection for peaches is the plastic tray used by Yakima Packing Co., Yakima, Wash. Made by Pantasote Co., New York City, the cell carrier holds 24 peaches, each in its own protective cup.

Colored dark blue or leaf green, the trays are locked in a fiberboard box. Two carriers are placed together by means of interlocking wire handles. Or the carriers may be distributed separately as half crates.

The cup prevents the peaches from rolling about or striking against each other, greatly reducing losses.

Circle 1 on Reader Service Card

Champagne Cork—In Plastic

Champagne fanciers need no longer worry about having to drink the entire jerboam once the bottle has been opened. A polyethylene closure developed by Bakelite now means that the "cork" can be reinserted to keep the contents of an open bottle sparkling and fresh for days.

The closure still accommodates the wire hood and foil cap so much a part of every good wine bottle. Stopper has been shaped into the characteristic mushroom. A serrated edge has been molded into the rim.

The new closure is reported to cost only half as much as the cork, often made of from 5-7 pieces.

Circle 2 on Reader Service Card

Pack Cheese in Aluminum Cans

Newest food item to be packaged in aluminum cans is MacLaren's Imperial Cheddar Club Cheese. The new ½ lb. package was researched and developed by the Container Div. of Kaiser Aluminum Co. in cooperation with National Dairy Products Corp.

Food grade coating on the interior of the can eliminates a foil liner previously used in the old package.

An aluminum overseal is placed over the canister top for product protection. Wide testing of the new package by National Dairy has revealed the elimination of product handling costs on the production line and the enhancement of the keeping qualities of the refrigerated product.

Circle 3 on Reader Service Card

GF Expands Fancy Food Line

The Fourth Annual Fancy Food and Confection Show in New York City was the scene for the debut of seven new General Foods Gourmet Foods.

The new items, all packaged in accordance with the bright General Foods family labeling, included lobster newburg, bouillabaise soup, smoked turkey pate, smithfield ham and cheese pate, babas au rhum, concentrated marinade piquante, and spiced cherry herring preserve. These additions bring the processors line to a total of more than 60 items.

Foil Dresses Up Ice Cream

Four individual servings of diced cream are packaged in a bright foil-wrapped carton by Barricini, Inc.

Each serving is 3½ fluid ounces.

An unusual feature of the package is the vertical labeling which shows to good advantage in cabinet storage. Different colors are used to identify the various flavors: brown for chocolate, blue for vanilla, etc.

Bright cartoons boost the eye-appeal of the packages.

Packages are supplied by Oneida Paper Products, Inc., Clifton, N. J.

Circle 4 on Reader Service Card

The attractive new Ritz box contains three individual *round*

THE
Rotor Lift
ELEVATES AND CONVEYS DRY, FREE FLOWING FOOD MATERIALS
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MORE DEPENDABLY
MORE ECONOMICALLY
... capacities up to
6,000 cu. ft. per hr.
ROTOR LIFT—the processing industries' ORIGINAL and FINEST vertical screw elevator—is engineered and constructed to world-famous standards of precision.
Whatever YOUR process demands of screw elevators, ROTOR LIFT supplies the most dependable and space-saving answer. WRITE FOR ENGINEERING CATALOG or personal consultation.
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World's Largest Manufacturer of Vertical Helicoid Screw Elevators
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New Packages & Products

New Midget Coffee Can

Designed for mobile coffee drinkers who prefer to brew their own is Nash's 4-oz. can. Being marketed in the Midwest, the package is ideal for picnics, outings, fishing and hunting trips.

The lithographed can was originally added for vending machine use.

New Product Shorts

French Fried Onion Rings have been launched by Birds Eye. Each package of the frozen product serves 3-4 people.

Chicken Gumbo and Chili Soups have been added to the H. J. Heinz line of soups.

84th Cake Mix for General Foods is Swans Down Golden Pound Cake Mix.

Served Hot or Cold is Morrell sliced Grill Loaf. Product is made of ham, pickle loaf, cotto salami, bologna and other meats in a cheese base.

Sweet Potato Pie has been introduced to retail frozen food markets by Treado and Clark Industries, Sylvania, Ga.

Southern Favorite, pan-ready mullet has been moved into national distribution by Ramos Shrimp Co., Ala. Fish is quick-frozen.

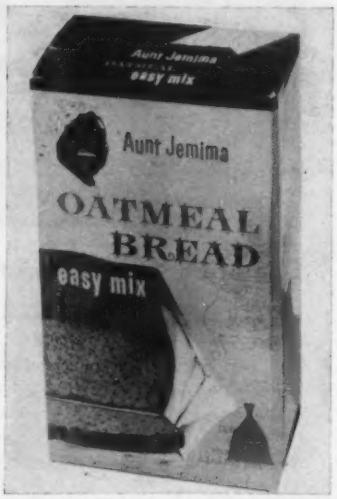
Tuna Now in Jumbo Can

Prompted by the advice of 61 million consumers in medium-sized families, Van Camp Sea Food Co. has launched a family size can of its Chicken of the Sea tuna. The advice was obtained in an extensive survey. The result is a 9¼-oz. package to supplement the processor's 6½, 7, and 12½ oz. cans.

Executives of the company have predicted that possibly as much as 37% of the total grocery-store tuna market will eventually be accounted for by the new family-size pack.

Quartet for Baby

Designed to provide junior with a variety of cereals and to enable Mother to determine which one he likes best is Beech Nut's new quartet package. Four individual 1-oz. boxes of rice, mixed cereal, oatmeal, and hi-protein are bound together in a zip-open pack.



NEWEST CONVENIENCE FOOD from Quaker Oats Co. is Aunt Jemima Oatmeal Easy Bread Mix. Complete with a plastic bag for mixing and an aluminm baking pan, the product was introduced nationally last month. Baking time is 45 min.

Packaging Briefs

Frozen Convenience line has been added to the Topco Associates line. Using the Dining-In label, the new series has been launched with 8 products.

Consumer-Size Tins have been adopted for Atalanta Products Corp.'s imported Polish ham. Sizes are 3, 4, 5 lb.

Good News for pouch packagers is Continental Can Co.'s new Thermolam, a polyethylene-Mylar laminate with high resistance to heat, gas, and grease.

Foil Label dresses up new San Giorgio spaghetti sauce cans.

50% Sales Rise is reported by Golden Glow Dairies, Albany, Ga., with use of a new 12-oz. cup with a clear plastic lid. Package is by Dixie Cup.

New Shrinkable Film is to be marketed by Dobeckmun Co. Called Saran Wrap-S the transparent film is designed for packaging fresh poultry, fish, cured and processed meats, and cheeses.

Corporate Symbol, a stylized cereal bowl, will now be used on the seven General Mills ready-to-eat cereals.

Ritz has a reason...

The attractive new Ritz box contains three individual *round* recloseable packets . . . formed with a special laminated glassine. All the freshness, crispness and flavor of Ritz is tightly sealed in . . . and the chance of breakage, common to loose cracker packaging, has been eliminated. It's just one more proof that *protected by Riegel* means *extra* benefits . . . product protection always, plus flexible packaging materials that are:

. . . tailored to run at high speeds on automatic machines
. . . made to your own specifications; printed, waxed, coated and laminated combinations of all types
. . . packaging materials that are made right, run right and are priced right.

Hundreds of today's best-sellers benefit from uniformly effective system of product protection. You can too.
Write Riegel Paper Corporation, 260 Madison Avenue, New York 16.

Riegel

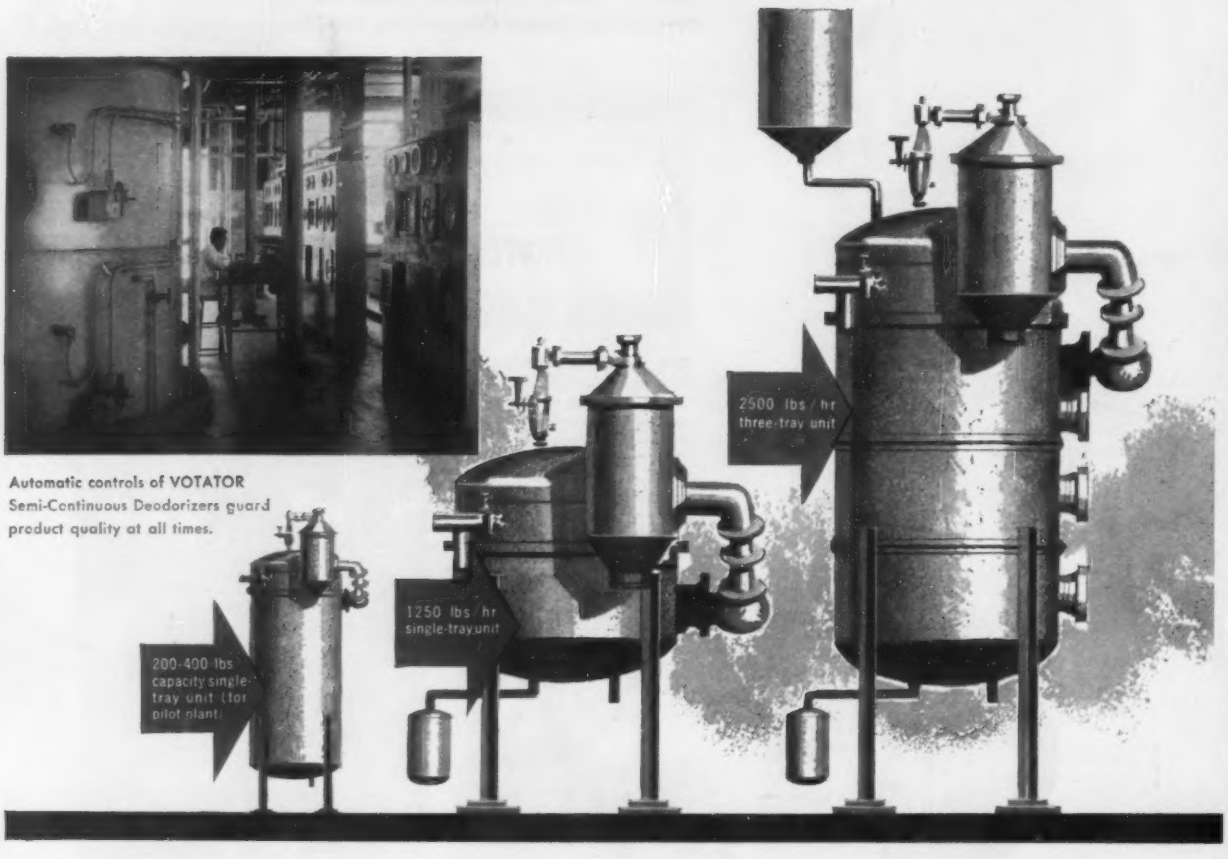
PROTECTIVE PACKAGING MATERIALS

New packaging for Ritz uses individual circular packets formed with a special laminated and over-waxed glassine. Packaged at high speed on Nabisco custom built machines.

For more data, circle 264 on Reader Service Card

A VOTATOR® DEODORIZER FOR EVERY NEED...to help you produce the best oil at lowest cost

Automatic controls of VOTATOR Semi-Continuous Deodorizers guard product quality at all times.

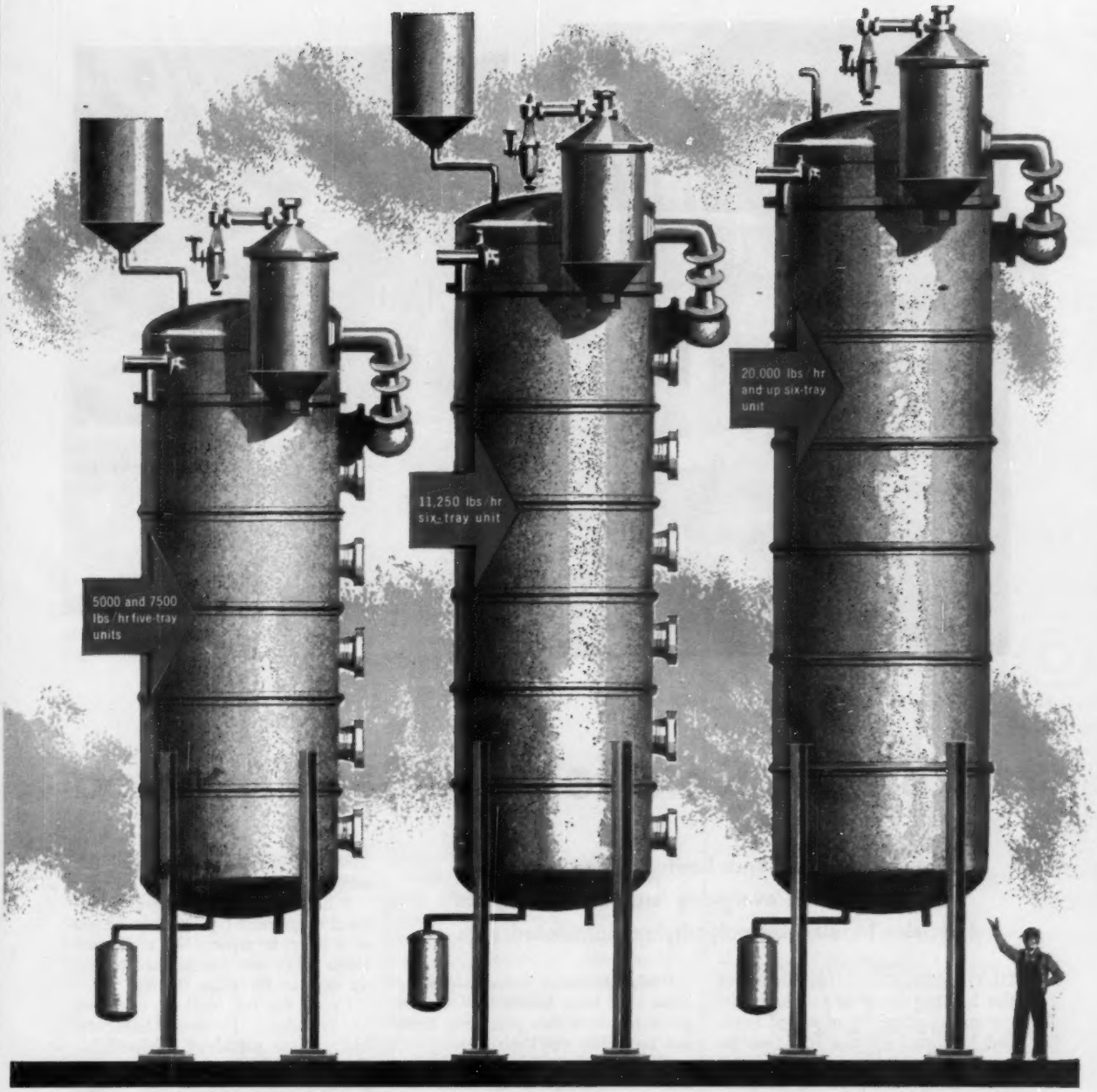


ALL SIZES. Girdler manufactures VOTATOR* Semi-Continuous Deodorizers in capacities to suit every requirement . . . from pilot plant size to production units of over 20,000 lbs per hour.

STANDARD OF QUALITY. VOTATOR deodorizers are recognized the world over as the standard of performance for upgrading oil and for steam-refining . . . unexcelled product quality, economy of operation, compactness and flexibility.

ADVANTAGES...

- ***No Metal Effect*** on color or stability; hot oil contacts only nickel or stainless steel.
- ***Unique Design*** prevents air leaks into oil and provides uniformly low vacuum from top to bottom.
- ***Complete Deodorization***—maximum interface between oil and steam provides intense stripping action and there is no refluxing of distilled impurities.
- ***Short Time Heating***—oil is at deodorizing temperature for only one hour or less.
- ***Automatic and Complete Operation***—heating, deodorizing, cooling and introduction of additives in a single vessel.



• ***Feedstock Changes*** are quickly made without intermixing.

• ***Outdoor Installation,*** if preferred, to save costly building space.

ENGINEERED TO YOUR NEEDS. Many companies employ Girdler services for comprehensive engineering studies when planning new plants or the expansion and modernization of existing facilities. We will study your operations and make recommendations to suit your specific needs. For information on this service, call our nearest office.

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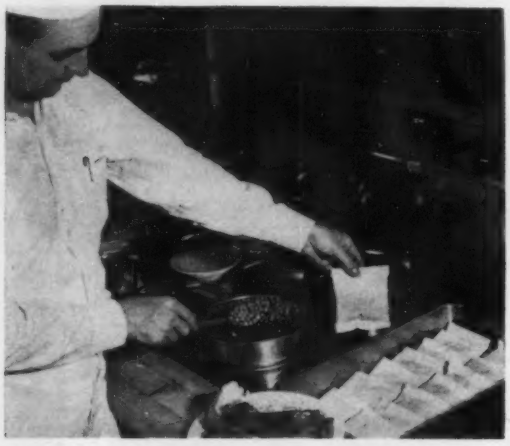

OLD VS. NEW way of readying peas for table. Chef ladles out overcooked product from pan with one hand while simply selecting boil-bag of quality-protected vegetable from steam tray with other hand.

VEGETABLES are fed from hopper of single-head machine. Worker adds butter pat during filling step. A second employee checkweighs bags.

Bigger Role for Boil-Bags Assured

Easy-use cook-ins, once limited to gourmet trade, now styled for every-day staples—with price barrier hurdled by polyethylene-laminated sack

ULTIMATE CONVENIENCE of the boil-bag has really boomed its use on the premium-price food front. But high package cost has—thus far—tended to block adoption of this handy feature for lower-tag competitive products.

Now, however, the debut of a low-cost boilable bag—pouch paper laminated on the inside with medium-density polyethylene—opens the gate to wider applications of these cook-in containers.

This development augurs significant strides:

▶Manufacturers whose packaging ideas have been hobbled by the expense factor of this promising move can now carry out their plans.

One firm that is pouch-packaging single-portion frozen vegetables says that the new bags cost but .005c. apiece, as against 2.5c. for the earlier cook-sack.

▶The new cook-in container may be just what's neeeded to lift frozen vegetables off the sales plateau where they've clung in recent years.

It's noted here that the rate of gain of these products has lagged behind that of concentrates and the newer prepared foods.

▶Boil-bags need no longer be confined to gourmet-type items purveyed at a price to recoup the additional costs. They now can be used to pep up sales of every-day staples.

Credit for the breakthrough goes to Shoreland Freezers, Salisbury, Md., whose president, Richard M. Cooley, sought for two years to find a convenience package that would give him a merchandising edge in the very competitive institutional field.

R&D work aimed at creation of a boilable bag employing a packaging material that would speed heat transfer, provide dependable heat seals that wouldn't break when temperature jumped from −40F. to 212F., and be economical to use.

Foil was tried at first, but ruled out because of its heat reflectance. Special film laminates were found to work satisfactorily, but their cost was considered beyond reach.

Finally, Shoreland called in Spencer Chemical, Kansas City, Mo.,

Creating The Package

No matter which *FINISH* you like—you can buy it in

SINGLE-PORTION units are packed 12 to carton, 12 cartons to shipping case. Pack is designed for hotel, restaurant, hospital, drive-in, and cafeteria trades.

By New Low-Cost Pouch

resin supplier. All-polyethylene bags were run experimentally, but sealing snags cropped up too often. In the end, the problem was solved by a 25-lb. super-calendered white pouch paper coated on the inside with medium-density polyethylene.

How It's Done

With the bag problem solved, Cooley next developed a semi-automatic line for handling portion-packed vegetables. Here's how the process works:

Peas, for example, are precooked by steam for 10-12 min. (compared to the conventional 2-3 min. water blanch). Then, they're seasoned and flavored by immersion in a special solution — monosodium glutamate, salt, sugar, and corn-syrup solids. (This solution acts as the "medium" in which the vegetables are later warmed up at the restaurant kitchen level.)

After they're individually quick frozen on trays, peas are fed through a volumetric filler (General Packaging Equipment Co.) which forms-fills-seals 45-50 boilable bags/min.

Currently, Shoreland is bag-packaging green peas, cut corn, baby limas, cut green beans, mixed vegetables, succotash, and asparagus cuts and tips. Planned for the near future are other free-flowing items, including fordhook limas, peas and carrots, and diced carrots.

Admittedly, overall cost of the new method is somewhat greater than that for the conventional 2½-lb. carton—enough to make the price 30-40% higher, in fact. That's because of the extra precooking step, the addition of butter and seasoning, greater use of packaging material, and transferrence of the waste-shrink factor (about 5% when vegetables are cooked in large batches) from the restaurant back to the plant level.

Also, the bags have a much slower filling rate. Considering that 40 to 50 2½-oz. pouches are filled per minute, that adds up to a product weight just under 8 lb. Compared to that, high-speed units fill 70 to 80 2½-lb. cartons/min.

Despite the higher price, Cooley

Outstanding Accuracy

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Dial Thermometer

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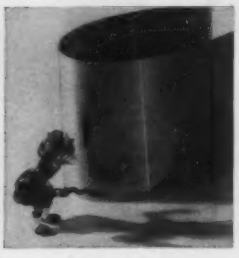
2D—A silvery white, but non-lustrous, surface produced by annealing and pickling cold reduced material. Steel sheets and strip in this condition are most ductile and the surface holds lubricant well for severe drawing operations.



2B—Steel in the 2D condition which is subsequently rolled on a "skin pass" or temper mill. The surface acquires a bright finish from the polished rolls. This surface is somewhat more dense and hard than 2D and is a better starting surface for later finishing and buffing operations.

No. 3—This surface is made by grinding with a No. 100 abrasive. This surface is smooth but not as reflective as 2B.

No. 4—A finer finish than No. 3 made by grinding with a No. 150 abrasive. Like No. 3, this surface is easily blended with hand grinders after forming, drawing or welding.

No. 7—Good reflectivity and brilliance made by polishing with a No. 400 abrasive. This semi-mirror finish must be protected during fabrication by adhesive paper or strippable plastics lest the finish be marred beyond repair.

BRIGHT—A highly reflective surface made by cold reducing with highly polished, glass-hard rolls. This finish is only available in Type 430 stainless.

These are our standard surface finishes that are available in types 201, 202, 301, 302, 304 and 430 except Bright which is type 430 exclusively. **These finishes are regularly supplied in sheet and coil form in widths up to 48 inches.** Since Nos. 3, 4, 7 and 430 Bright are smooth reflective surfaces, they are not recommended for severe drawing without special precautions as the mill finish may be marred. Applications such as dairy machinery, kitchen and restaurant equipment and architectural decorative work require only local forming, so these highly polished surfaces are not greatly disturbed. All mill polished sheets are carefully packed to avoid handling imperfections. Protective adhesive paper can be specified by the buyer when needed. For specific information on recommended surface characteristics for a particular stainless steel sheet and strip application, address your request to our Product Development Dept.

WASHINGTON STEEL CORPORATION

Producers of Stainless Sheet and Strip Exclusively **10-W Woodland Ave., Washington, Pa.**

Creating the Package

is convinced the bags will catch on. He stresses the following advantages in bag use by institutional operators:

1. Portion control, one of the most important elements in restaurant operations today, is now extended to big-volume vegetables. Uniform-sized servings allay customer complaints about small-sized portions, also curb the costly waste of oversized helpings. According to Cooley, surveys show there's a 40% variation in the size of vegetable servings in public eateries.

2. Maximum quality is assured. Since the moisture-proof bag protects the vegetables from the leaching effect of boiling water, products arrive at the diner's table with all their garden-fresh goodness intact.

3. Saves on expensive equipment. Ordinarily, chefs have to cook vegetables in big batches, then leave them soaking in steam tables until orders come in. This has forced the use of expensive equipment especially designed for short-time cooking of small amounts of vegetables.

Now, all that is necessary is to warm up the bags in a regular sauce pan. A further advantage is that several product varieties can be cooked in the same kettle.

4. Labor costs are slashed. Preparation work is cut to a minimum, since the product is already precooked and seasoned. Also, pan-cleaning is out.

5. Profit-eating waste is eliminated. Ordinarily, there's a 5% loss when vegetables are batch-cooked in water for extended periods.

Confident of the bag's success, Cooley is readying an ambitious package-marketing program.

First in order is a retail line, expected to debut in a few months, consisting of two different pouch sizes. A "V for 1" line will include three 2½-oz. bags to the box and a "V for 2" line will have two 5-oz. bags to the package. Cooley figures that the second line will find big acceptance with two-member household units.

The company is also working with machinery makers to design an automatic packaging unit that will handle non-free flowing products. Once this is done, the cook-ins can be extended to such products as French green beans, leaf and chopped spinach, and chopped broccoli.

Looking further into the future, Shoreland hopes to hit pay dirt with a line of gourmet-type frozen vegetables put up in boilable bags. Different kinds of sauces will be included. —*FE Staff*

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after many months on the shelf, your product looks

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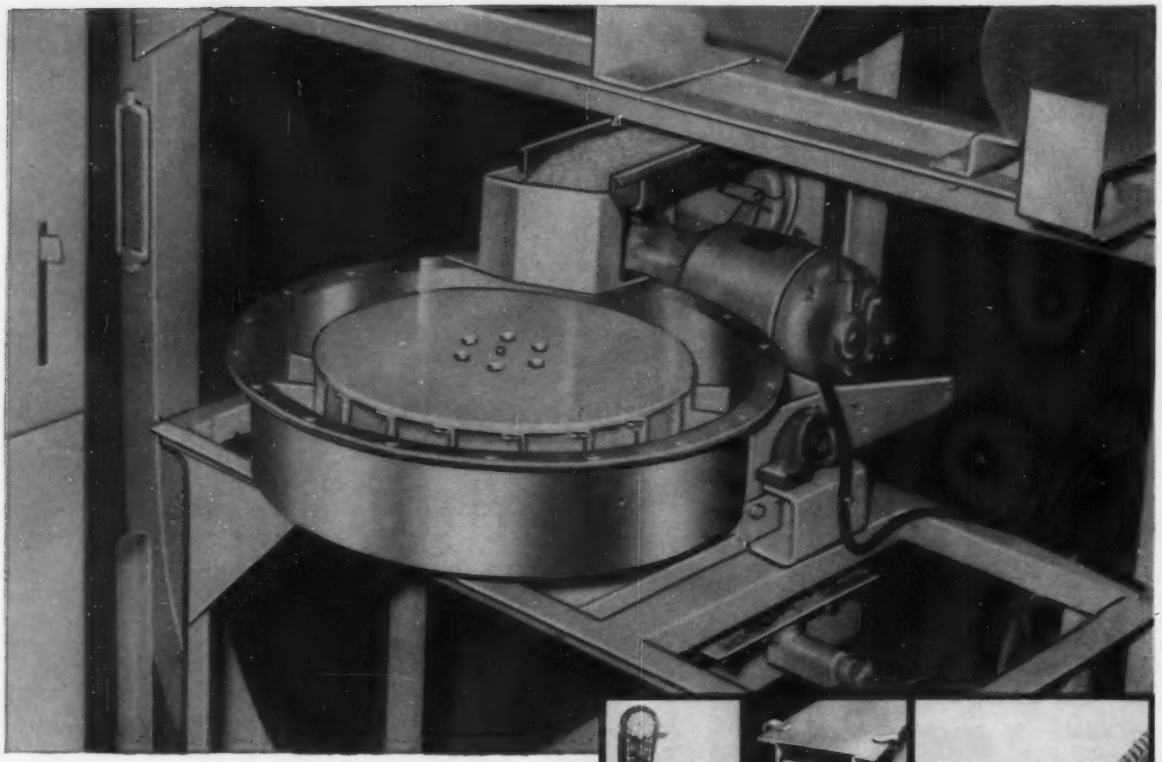

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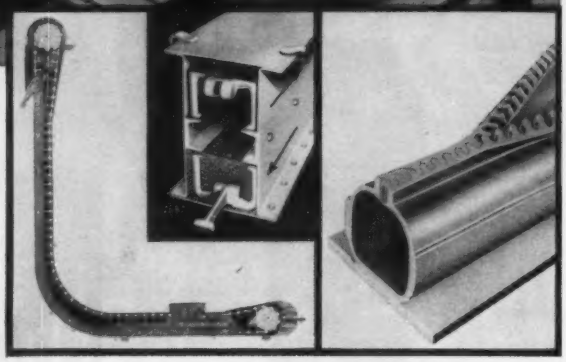
The STEPHENS-ADAMSON Continuous Weigher weighs material continuously while in motion with extreme accuracy. Material entrance and exit points are in line with pivot axis of weigher providing for easy installation within existent processing operations and completely eliminating all discharge terminal errors. The unit handles hot material with equal accuracy. Minimum headroom is required. The weigher can be adapted with control equipment for accurate gravimetric feeding without requiring extensive plant alterations. STEPHENS-ADAMSON engineers will be happy to work with you on automating your processing operations.



S-A REDLER CONVEYOR

Skeleton flights, linked together and moving through totally enclosed casings, induce the mass movement of powdered, granular or flaky bulk materials in any direction. Gentle conveying action and sealed casings mean maximum protection for materials handled. Redler units combined with Continuous Weigher offer automatic operation.

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Literally a moving, material-carrying conduct, the zipper closed belt, conveyor-elevator is capable of transporting bulk materials in any plane, to considerable heights and around obstructions. Bulk materials are conveyed free of breakage, agitation or segregation within the sealed and dustight belt. The zipper combined with Continuous Weigher is ideal for automatic feeding operations.

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...and DuPont's new technical service will be there to help you solve your painting problem!

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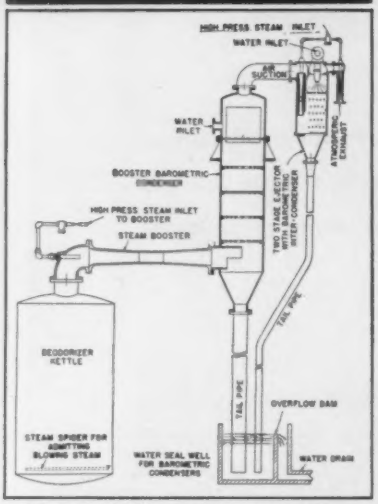
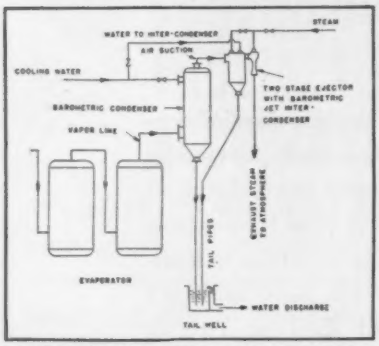
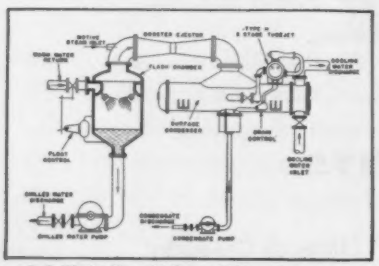
C. H. WHEELER



In Deodorizing Operations—C.H. Wheeler Tubejet® Booster with Barometric Condenser, and 2-stage Tubejet with Wheeler Barometric Inter-Condenser, produce high deodorizer vacuum. No moving parts means less Tubejet maintenance.



In Evaporation, Tubejet Ejector works with Wheeler Barometric Condenser to produce high vacuum. Initial cost of Ejector is low installation easy because of lightness, simple connections.



C. H. Wheeler Steam Jet Vacuum Refrigeration is used extensively in producing cold process water for food and chemical plants. Where there is an abundance of steam at low pressure and cooling water for the condensers, this is an ideal way to produce chilled water at low cost, with trouble-free equipment.

FREE! 35-page Catalog 1462.

Process Equipment Division

C. H. WHEELER MFG. CO.

19th and Lehigh Avenue, Philadelphia 32, Pa.

CASE HISTORY OF MONTH

From files of National Consumer Panel Division of Market Research Corp. of America. Material is factually correct. Identities of product and companies have been masked to insure anonymity.—The Editors.

Tracking Down Lost Customers

Management's problem

ONE OF OUR PRODUCTS, a convenience item, is not making satisfactory sales progress. As far as we have been able to observe, this is also true of the other brands in this product category.

Sales are static, except for short-term spurts when unusually heavy promotion is placed behind a brand. Also, quarterly customer counts show little change.

To guide our forward planning, it is necessary to determine whether the market for this kind of product is tending to level out, or whether an as-yet-untapped sales potential exists.

What Would You Do?

Management's decision

To uncover the underlying reasons for lack of appreciable growth on the part of either the market or individual brands, management authorized an analysis of the purchase records of families in the National Consumer Panel. The study had a two-fold objective: (1) To make brand-to-brand comparisons of repeat buying and customer gain or loss. (2) To reveal the relative customer gain and loss picture for the entire market.

Result of action

A significant, and previously concealed, fact was brought to light: Although there was little change from one quarter to the next in the total number of customers buying the product, different people were doing the buying. Lost customers outnumbered repeat purchasers by 2 to 1.

For individual brands, this ratio of lost to repeat buyers was even greater. That was to be expected, because brand switching within the market causes individual brands to have higher lost-customer ratios than the total market.

Significantly, the study showed that only a handful of any brand's lost customers remained in the market for this kind of product. The rest presumably had gone over to competing product lines.

Inasmuch as total customer count levels were steady, there was only one possible conclusion: The product was attracting many new buyers, but they were being offset by lost customers.

This indicated a clear course of action for management. Attention would have to be focused on improving the product to the point where a more loyal consumer franchise would be established. The fact that substantial numbers of new customers were entering the market indicated that it would be worthwhile to make the effort.

For more information, write to Case-History Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y. Your inquiry will be directed to source of case-history item.

〈 *Another Sucaryl advertisement, in the Saturday Evening Post*

WATCHING YOUR WEIGHT?

Watch that label

THE BEST TASTING DIET FOODS AND DRINKS SAY

SWEETENED WITH Sucaryl

Abbott Laboratories, North Chicago, Illinois and Montreal, Canada. ®Sucaryl – *Abbott's Non-Caloric Sw*

Here

〈 *Another Sucaryl advertisement, in the Saturday Evening Post*

THE TRICK IS TO BOOST SALES— AND IT'S EASY WHEN YOU PUT THIS

SWEETENED WITH **Sucaryl**®

ON THE LABEL OF YOUR DIET PRODUCT

Wonderful how simple it is to raise the sales of your diet foods or beverages.

First, you sweeten them with non-caloric Sucaryl.

Second, you let people know you did by putting the little Sucaryl seal on your label, in your advertising, on your displays.

Sucaryl, you see, is not only the most popular (by far) of all non-caloric sweeteners. It is also pre-sold in another way—via an unusual new advertising campaign (see left) that aims solely to sell *your diet products* when their labels say "Sweetened with Sucaryl."

It all adds up to a pre-selling program that's totally unprecedented in its field. Yours for the asking! (See the coupon below).

For complete information about Sucaryl, send for our booklet: "Making the Most of the Dietetic Market with Sucaryl." Address Chemical Sales Division, Abbott Laboratories, North Chicago, Illinois. On request, too, we'll send you a supply of Sucaryl for your own test purposes.

Please send booklet "MAKING THE MOST OF THE DIETETIC MARKET WITH SUCARYL"

Name_____

Firm Name_____

Address_____

City_____ State_____

Your Title_____

Caloric Sweetener

Here's Sucaryl's current "ad-of-the-month"

A NEAT TRICK

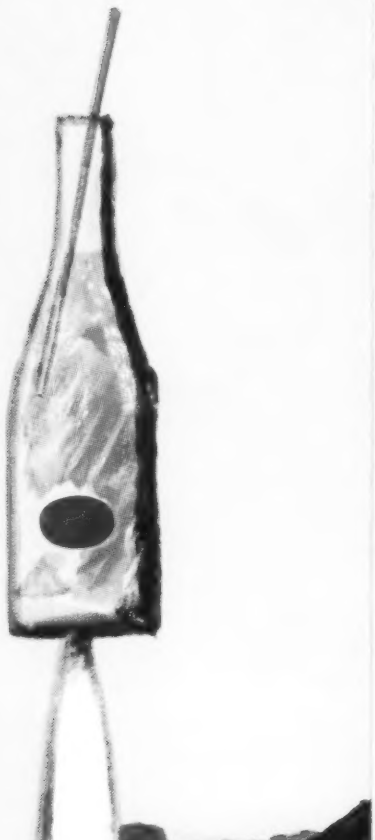
AND

YOU

CAN

DO

IT!



H

1 c.
2 tbs
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1 tsp

1 tbs
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Crus
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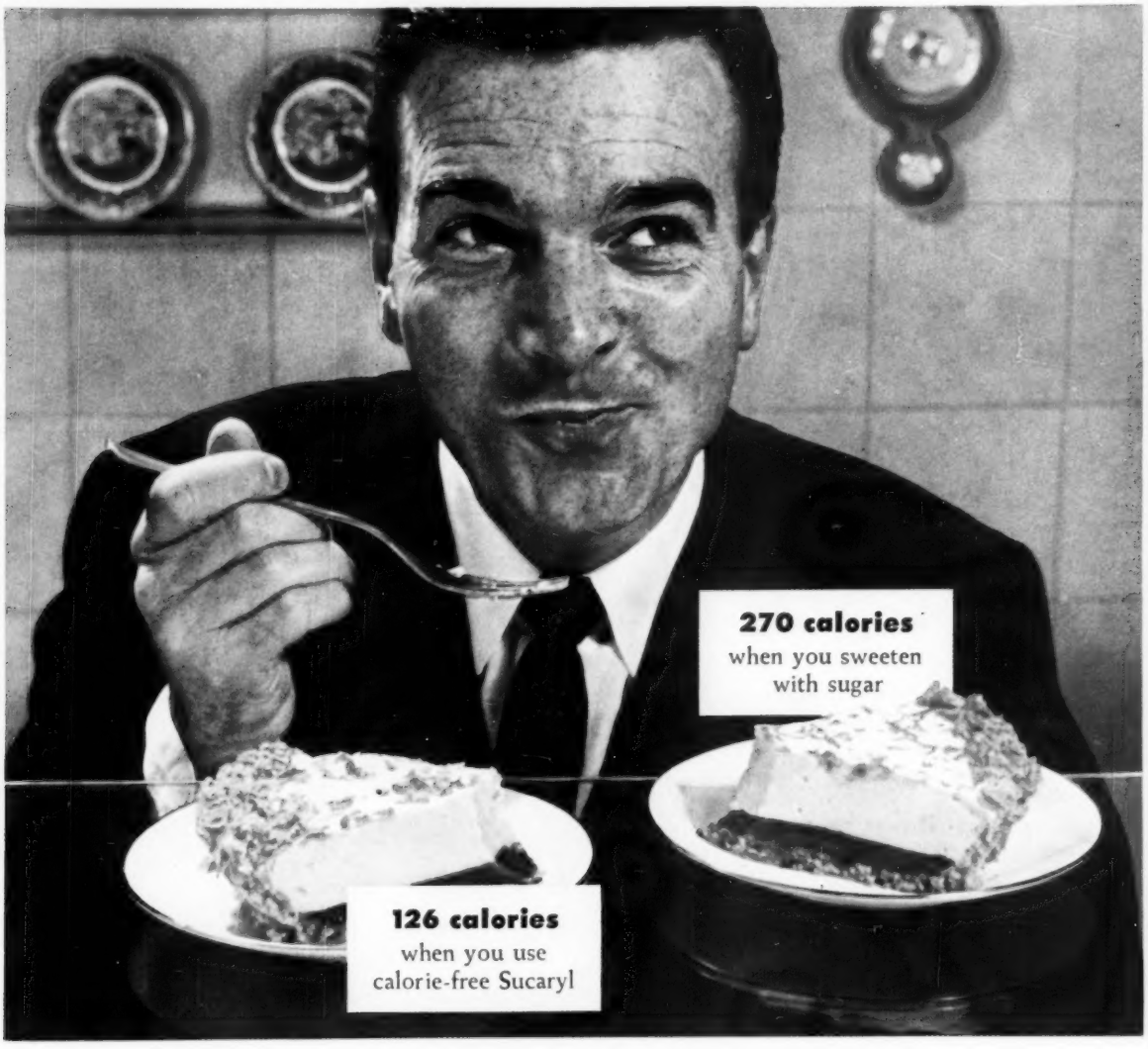
Here's Sucaryl's current "ad-of-the-month"



You can't taste the difference, but

Sucaryl makes it lots easier to cut down calories

WEIGHT WATCHER'S BROWN DERBY PIE

Crust:

1 c. crushed cornflakes
2 tbsp. melted butter
1 tbsp. nonfat dry milk
1 tsp. Sucaryl solution

Filling:

1 tbsp. cornstarch
1 tbsp. Sucaryl solution
½ tsp. salt
2 c. skim milk
2 eggs, separated
1 tsp. vanilla
2 tsp. Sucaryl solution
2 tbsp. cocoa
1 envelope gelatin
¼ c. cold water
2 tsp. rum flavoring

Crust: Combine all ingredients. Press into 9" pie plate. Bake in hot oven (375° F.) about 12 min. Save a few crumbs for the top. **Filling:** Combine cornstarch, 1 tbsp. Sucaryl, salt, in top of double boiler. Gradually add milk mixed with egg yolks. Cook over hot water until thick, stirring constantly. Remove from heat. Add vanilla. To 1 cup custard mixture, add 2 tsp. Sucaryl and cocoa, blending well. Pour into crust. Chill until firm. Soften gelatin in cold water and blend into remaining custard. Stir until dissolved; add rum flavoring, cool. Beat egg whites stiff and fold into custard. Spoon over chocolate layer and chill until set. (7 servings)

FREE—Our new cookbook, "Calorie-saving Recipes with Sucaryl," including dozens of new kitchen-tested ideas for desserts, beverages, sauces, dressings . . . 50 wonderful recipes in all! Get your free copy at your drug store.

Sucaryl simply says you don't have to trim portions to trim calories. No compromising your taste, either . . . any dish sweetened with calorie-free Sucaryl tastes just like its sugar-sweetened twin.

You use Sucaryl practically anywhere you would sugar. In tablet form, to sweeten your coffee, tea or any other drink. Solution, for fruits and cereals, for cooking and baking.

Sucaryl, of course, is for anyone sensibly counting calories, and for those who for any other reason can't use sugar. Low-salt diets call for Sucaryl Calcium. Abbott Laboratories, North Chicago, Illinois and Montreal, Canada. Abbott

New Table Bottle At Drug Stores Everywhere

Sucaryl®

Non-caloric Sweetener—No Bitter Aftertaste

Fancy Foods Move Closer to Big-Time

Recession or no, Americans haven't curbed their appetite for gourmet foods. Industry sources predict fancy food sales will top $70 million this year—up from $60 million in '57 (and $39 million in '55).

Four trends worth keeping an eye on:

General Foods' decision to place some of its gourmet products in supermarkets. It means that large volume outlets will play a bigger role in the gourmet trade.

American firms with overseas contacts—such as Nestlé—will consider importing fancy groceries that can be merchandised through their own distribution networks.

Retail store operators, feeling that non-foods' profits are nearing saturation point, will be more receptive to gourmet items as a means of tapping plus-sales.

Holiday gift offerings of higher-priced groceries will be used by some firms—Kraft is one—to sound out market possibilities of a gourmet line as well as rope in extra sales.

Brewers Streamline Sales Setups

With per capita beer consumption falling year-to-year —from 18.4 to 15.1 gal. in the '47-'57 period—and costs uptrending, brewers are reorganizing their sales structures for greater efficiency.

Miller Brewing replaced its sales division with a new marketing department that takes in advertising, field sales, market research, sales planning, and promotion. And Pabst, after creating two new vice-presidencies—sales and advertising—filled them with veterans from recently acquired Blatz Brewing.

Go South, Young Man

Interest in modernizing wholesale and retail facilities in Latin America points up that area's growing importance as an export market for processed foods. The realty affiliate of Grand Union plans to finish construction of Puerto Rico's first shopping center next fall. And Associated Foods, retailer-owned co-operative, will build a modern wholesale center there next year.

Market Testing Inside the Plant

Your own work force can be an effective consumer panel when it comes to taking soundings on likes and dislikes about your products. So suggested Roswell G. Eldridge, market research director, H. P. Hood & Sons, at last month's marketing conference of the National Industrial Conference Board in New York City.

Three groups drawn from its own employees are used by the dairy firm. They are: (1) Technical people trained to evaluate odors and flavors, (2) an office panel whose members are not drawn from either sales or production (to avoid people likely to have a product bias), and (3) another office panel about whose mem-

bers the company has built up a body of pertinent facts pertaining to family size, mode of living, social habits, and the like.

For extra important decisions, Hood supplements its own "panels" with an outside consumer panel. Then, results from all four sources are correlated.

Hefty Ad Budgets in '57

National advertising by food manufacturers jumped from $399 million in '56 to $424 million in '57, according to data compiled by *Advertising Age*. Significantly, aggregate expenditures by the 10 leading food advertisers remained the same for the two years: $300 million—indicating that it was the medium- and smaller-sized firms who fueled the increase.

Among the industry's Big Ten last year, GF, National Dairy, and General Mills ranked 1-2-3, same as in '56. Following in order, with comparative '56 ranking in parentheses, were: Borden (6th), Coca-Cola (4th), National Biscuit (tied for 7th), Swift (5th), Campbell (tied for 7th), Standard Brands (11th), and Kellogg (9th).

BRIEFS

Switch to franchised bottlers will key sales expansion program of Hires Co. President Edgar Hires says the local bottler has a better feel of the market than the remote corporation, can carry out split-minute decisions faster.

Higher prices spur faster turnover? Dole's favorable first-quarter performance was credited to heavy buying by grocery trade that followed company's announced intention to raise pineapple prices.

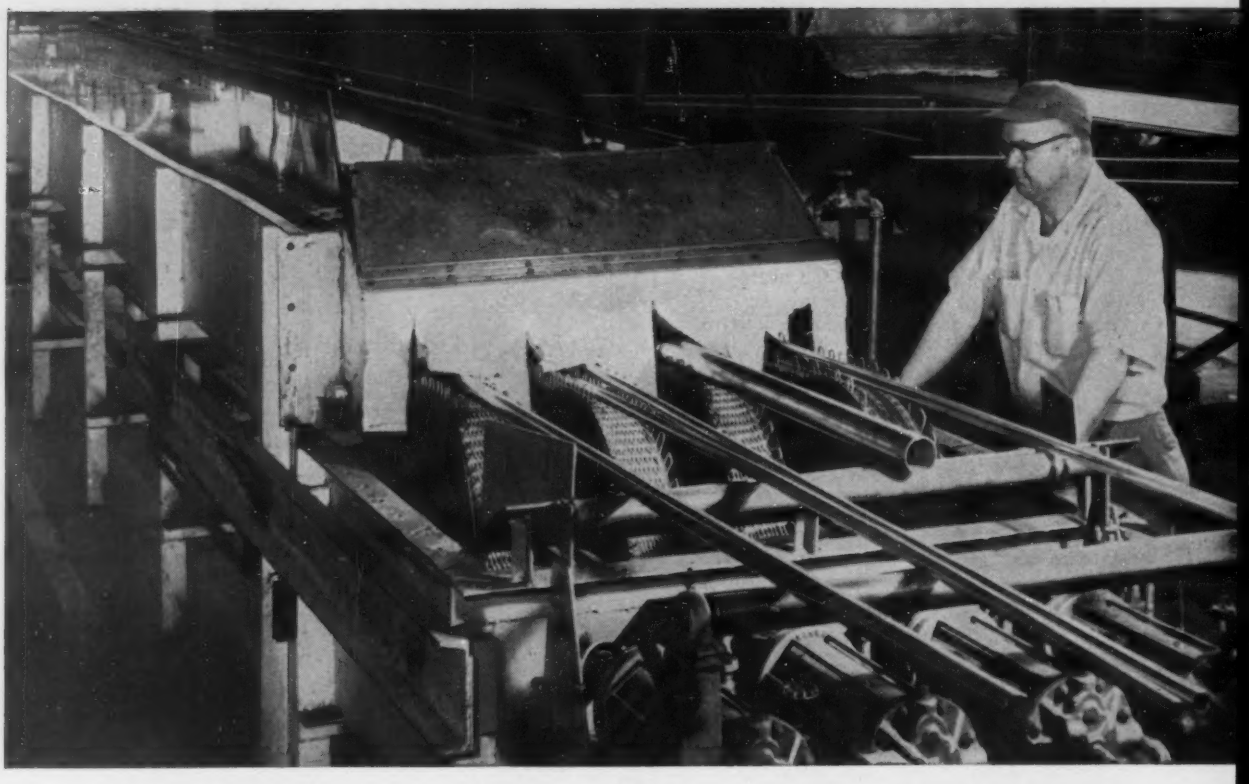
Survey on food buying habits in Los Angeles found 73.9% of the women reporting that advertising guided their purchases.

Instant cocoa or chocolate beverages are bought in 60% of all homes, reports Home Makers Guild. Initial purchase was inspired by product's convenience aspect, 37% of the respondents said.

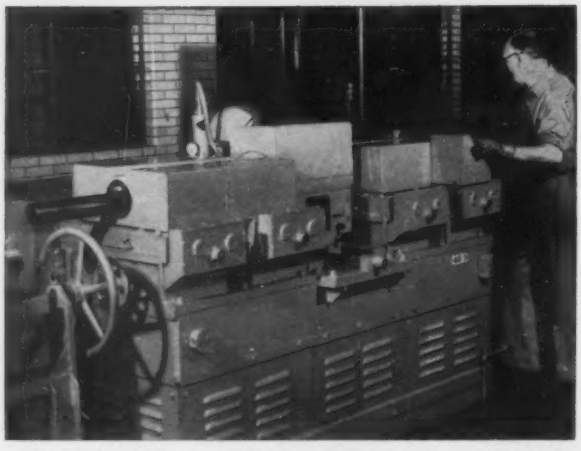
New products continue to account for a significant chunk of corporate product mix. Of Pillsbury's 211 items, 59% were brought out in the past 10 years. And E. F. Hutton brokerage firm reports that 20% of Calpak's volume now comes from items introduced in the last decade.

Retail food audit, covering a 1,700-store sample, was added by Market Research Corp., which already has a national consumer panel. Minimum price tag (for check on one item) is $300.

Big untapped market still awaits frozen pot pies and dinners. USDA's check of 3,134 households in the summer of '56 found that 52% of the families hadn't tried either product in the previous 12 months.



Bright Annealing Preserves Dense, Lustrous Surface of ELECTRUNITE Stainless Steel Tubing



FARROWTEST® is the best in non-destructive tests for tube irregularities. Tube moves through a group of test coils. The signal from these coils remains constant as long as tube is uniform and defect-free. Only Republic offers this electronic "eddy current" type non-destructive test. And it's available at the same cost as regular hydrostatic testing.

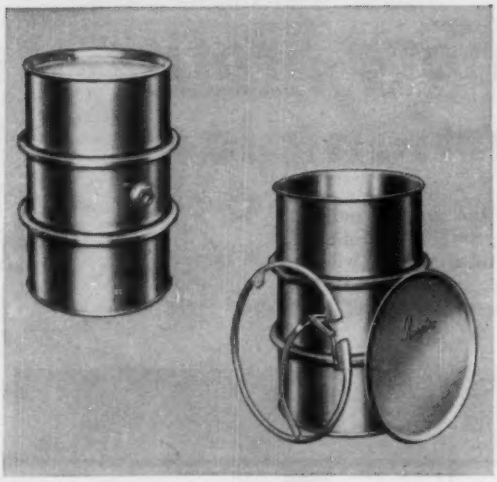
Here's news for every processor who needs stainless steel tubing and pipe with a dense, lustrous finish on both I.D. and O.D. Republic Steel and Tubes Division's new continuous bright annealing process produces a tube with a hard, high-quality finish in sizes from ¼″ to 4″ O.D. No scale is formed and no etching acid pickling is required.

Laboratory measurements show this finish to be smoother than ordinary pickled and open fire annealed tubing and pipe. This surface tends to resist build-up and caking of solids in piping and heat transfer equipment.

For many sanitary tubing applications, this bright annealed finish can be put into the line with no further polishing. Where further processing may be required, this bright surface cuts polishing to a minimum.

As in all of Republic's full line of stainless tubing and pipe, bright annealed products are produced from flat-rolled ENDURO® Stainless Steel, cold formed into tubular shape and joined by the "inert-arc" welding process. Every foot is uniform in wall thickness, of uniform diameter, and meets every requirement called for by ASTM and ASME specifications. Every foot reflects the skill and experience of the world's leading specialty tube maker.

Send coupon for more information on reducing your tubing costs with ELECTRUNITE bright annealed Stainless Steel Tubing, or call your Republic ELECTRUNITE representative.



MAXIMUM PROTECTION for your food products during storing or shipping is provided by Republic ENDURO Stainless Steel Drums and Barrels. They resist corrosion. Withstand hard use and abuse. ENDURO Drums and Barrels never need painting. Available in 30- and 50-gallon capacities. For more information about Republic Containers send coupon below.

FOOD, MEAT AND FISH PROCESSORS using salt or brine can end costly corrosion problems with Republic Titanium. It is impervious to the corrosive effect and pitting action of salt water and brine. Titanium equipment is easy to handle. It is as strong as steel, yet weighs only 56% as much. Republic metallurgists and engineers will help you apply this versatile metal to your production. Write today.

BREWERIES discovered years ago that ENDURO Stainless Steel is a valuable asset in producing beer with predictable and unvarying flavor, purity and clarity. ENDURO is completely inert in the presence of wort and beer. Danger of metallic contamination is eliminated. ENDURO's easy-clean and easy-to-keep-clean qualities mean that equipment has more productive hours and extra earning capacity. Send coupon for additional information.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. FE-5282-AK
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on the following subjects:
☐ Republic ELECTRUNITE® Stainless Steel Bright Annealed Tubing
☐ Republic FARROWTEST ☐ Republic Titanium
☐ Republic Stainless Steel Containers
☐ Republic ENDURO Stainless Steel

Name_____ Title_____
Firm_____
Address_____
City_____ Zone____ State_____

For more data, circle 273 on Reader Service Card

7 Ways to put more profit in your production plans

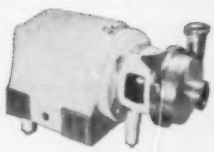
With all costs rising, now is the time to make every last penny of your production dollar work harder. We can help you to do it—with efficient production-and-profit boosting CP equipment specifically engineered and built to cut your production costs!

NEW Swept Surface HEAT EXCHANGER

Provides Economical CONTINUOUS Heating and Cooling of LIQUIDS or SEMI-SOLIDS—including ultra-H.T.S.T. Pasteurizing

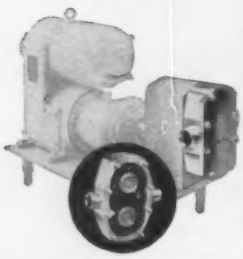
Available with one to 4 cylinders mounted on a single frame. (Ammonia or Freon models one or two cylinders only.) Housed in stainless steel.

Lowers cost of continuous heating and cooling of liquids and semi-solids; also ultra-H.T.S.T. pasteurizing. Cools to —30° F. or heats to 300° F. or higher. Heat exchange is uniform and efficient for entire run because Displacer-Mixer Blades continuously sweep product away from heat transfer surface. This increases heat exchange efficiency and reduces product losses from "burn-on" during heating. Ideal for all heavy bodied products that can be pumped. Write for Bulletin E-1300.



Sanitary Centrifugal Stainless Steel Pumps

Ruggedly built to reduce maintenance costs with special emphasis on economical fast cleaning. Can be dismantled without tools. Complete range of sizes and capacities to match the pump to the job—buying exactly what you need saves you money and operating cost. Pump both product and cleaning solution. Write for Bulletin H-1200.



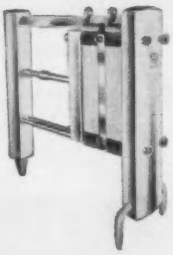
ROTARY Pumps Sanitary, Positive Type

New rotors with specially designed resilient surfaces. Parts can be replaced *on the job* in ten minutes or less when necessary. The perfect pump for metering flow of medium to high viscosity liquids. Write for Bulletin H-1290.

THE Creamery Package MFG. COMPANY

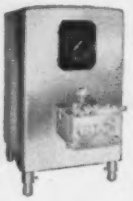
General and Export offices:
1243 W. Washington Blvd., Chicago 7, Ill.

THE MARK OF DISTINCTION IN FOOD PROCESSING EQUIPMENT



Crescent Plate Heat Exchangers

Cut gasket maintenance to less than half! Every plate a heat exchanger, only every other plate gasketed. Compact, stainless steel units save space and speed production. Meet U.S.P.H. sanitation standards. Can be continuous heater, cooler, H.T.S.T. pasteurizer or a combination of all three. Easy cleaning reduces costly wash-up time. Write for Bulletin E-1153.



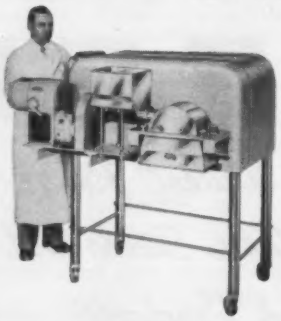
New Stainless Steel Multi-Flo Homogenizers

Complete new line for smoother, more efficient homogenization at lower pressure. Reduces power costs and machine wear. Includes revolutionary, high-capacity 5-cylinder model.

Refrigeration

Double savings: compact design saves valuable space—extra rugged construction saves maintenance. Choose exactly what you need from a complete line of Compressors and Boosters—and get the *extra* benefits that come from CP's generations of experience in building refrigeration systems serving many industries—and serving them well. Write for Bulletin V-18.

Cogmill Grinder-Blender



Distributed Nationally by

Write for Bulletin N-1406

Higher Depreciation Allowances Vital to Progress

That more realistic allowances for depreciation of new and used equipment are needed is not exactly news. But the importance of a change to the food industry is pointed up in FE's survey of obsolescence and modernization, the results of which are presented in this Plan '59 issue.

More than 50% of the equipment in food factories is over 10 years old. Productivity is not all that it should be. Yet costs are rising, and profit margins already are too thin for adequate investment in progress.

Observations by responsible men in our industry (cited elsewhere) leave no doubt about this. Their comments point sharply to too much obsolescence.

Obviously something should be done to ease the unjustly heavy economic burden involved in writing off price-inflated investments in new plant and equipment.

Depreciation pays 60% of expenditures

Nor is the food industry alone in this predicament. Depreciation accounts for 64% of total internal funds for all industry—retained profits for only 36%. Depreciation by itself provides about 60% of the cash used to finance plant and equipment expenditures.

A couple of entering wedges have opened the door to relief—at least a little. The 1954 tax law permits greater depreciation charges in the early years of new equipment service, via the double-declining balance and the sum-of-the-years' digits methods. These, however, do not apply to used equipment. They should.

Industry gets a minor but welcome assist from the "small business" provision in the tax revision act passed by the last Congress.

This provides that an extra 20% depreciation deduction may be taken in the first year after purchasing equipment. The deduction applies only to the first $10,000 in acquisitions ($20,000 in cases of joint husband-wife returns for unincorporated business). It would be subtracted from the original cost to determine the base for normal depreciation.

Large corporations also may take advantage of this provision.

Advocates of a reinvestment depreciation allowance are encouraged by the new legislation. They hope that this wedge can be driven deeper into depreciation-allowance restrictions.

Proposals that merit your support

Some specific proposals have been made to the Government. Food manufacturers should consider active support of some of them. They are:

1. Revise tables of useful lives in Treasury Bulletin "F" to make them more realistic.
2. Extend fast write-off methods to used equipment.
3. Permit 5-year amortization for all purchases of equipment.
4. Reduce depreciation period by half for first 15 years of useful life, and by two-thirds for any portion exceeding 15 years.
5. Base depreciation on replacement cost, rather than original cost.
6. Permit a reinvestment depreciation allowance. This would reflect the higher replacement cost and be taken in addition to normal depreciation in first year.

As sharply delineated in this special issue of FE, modernization must be accelerated for the good of industry and country.

More realistic depreciation allowances are vital to such achievement.

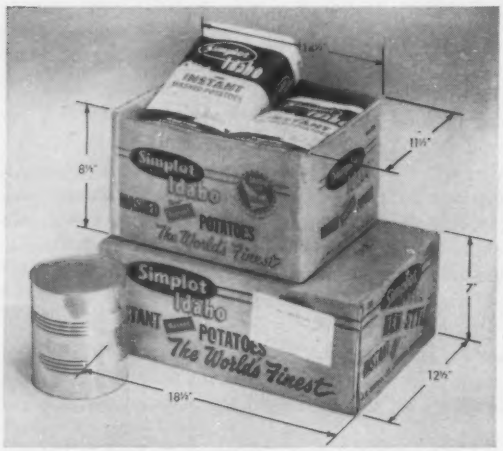
Get after your Congressmen to do something about it.

Packaging is more than "Skin Deep"!

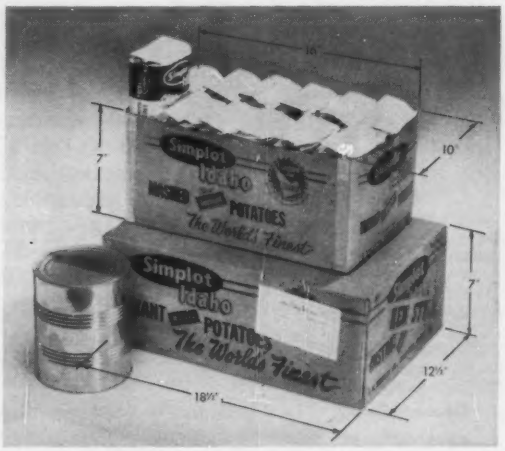
PACKAGING PROBLEM

The Simplot Company was packaging their Instant Mashed Potato granules in #10 tin cans. They were concerned with the package because some small restaurants were unable to use a complete can at one time (each can contained enough product for 150 servings). The cans were expensive, and their weight made shipping charges high.

Simplot working with Western-Waxide's Research and Development Laboratory went in search of a package that would provide the needed protection, convenience, and economy.



10# bags save 201 cu. in., carry 40 lbs. per case!



3# bags save 498 cu. in. per 36 lbs. product!

SOLUTION:

Western-Waxide's Research and Development Laboratory had previously developed a bag for a dried milk producer. Called the Crown Dri-Pak* bag, its construction is bleached kraft paper laminated to .00035" foil with polyethylene coating over the foil. Bag closure is achieved by heat sealing with standard equipment. It is strong, an excellent water-vapor barrier, very economical, and can be produced in a variety of sizes. It is also easy to reclose for temporary protection of unused portions.

Crown Dri-Pak bags filled with Simplot instant potato granules were placed in the "tropics room" of the San Leandro Laboratory, R. H. 90% and temperature 100°. Ninety days later, the sample showed *only ½% moisture gain*—and no trace of discoloration or flavor damage. These tests clearly indicated that the Crown Dri-Pak bag was the answer to this packaging problem.

Two bag sizes were adopted—3# and 10#—to provide maximum convenience to customers. Most small restaurants use the contents of the 3# bag (75 servings) at one time. If there are leftovers, the dead-folding properties of the foil allow the bag to be folded over snugly for further protection. Larger institutions find the 10# bag suits their daily needs.

The new package is economical: 3# bags, packed twelve to a shipping case, result in combined packaging and shipping savings of $17.80 per ton of product. The larger 10# bags, packed four to a case, reflect a savings of $28.70 per ton of product. In addition, the bag is easy to open, handle, and reclose; less storage space is required (see photos above) and empty bags are more easily disposed of than tin cans. And as a "bonus extra," Simplot now benefits from strong brand identification from each unit—for each bag is printed in red and blue on a sparkling white background.

This case history is another successful packaging application of an extremely hygroscopic product in Crown Dri-Pak Bags.

The personnel and services of Western-Waxide's Packaging Research and Development Laboratory can turn packaging problems into profits for you! Write or phone your nearest Western-Waxide office today.

*Dri-Pak is a trade mark of Crown Zellerbach Corporation.

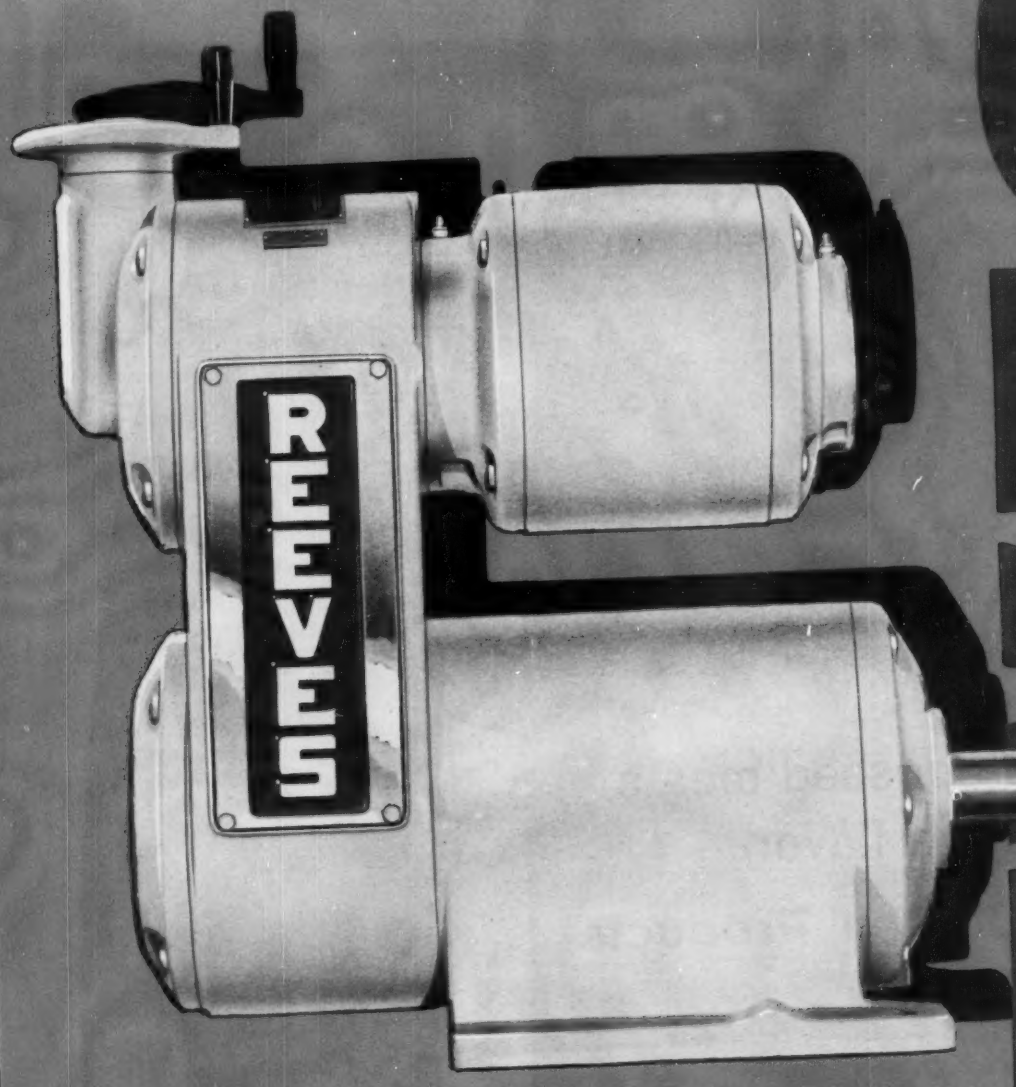
CROWN ZELLERBACH WESTERN-WAXIDE DIVISION

Headquarters Office: 2101 Williams St., San Leandro, Calif. • Plants and Sales Service Offices in Principal Cities of the United States

Manufacturers and converters of plain and printed waxed paper • foil • foil laminates • polyethylene coated paper and poly-film laminates • films • bags • pouches and other specialized flexible packaging materials

For more data, circle 275 on Reader Service Card

For more data, circle 276 on Reader Service Card



REEVES

Sanitary Type

VARI-SPEED MOTODRIVE

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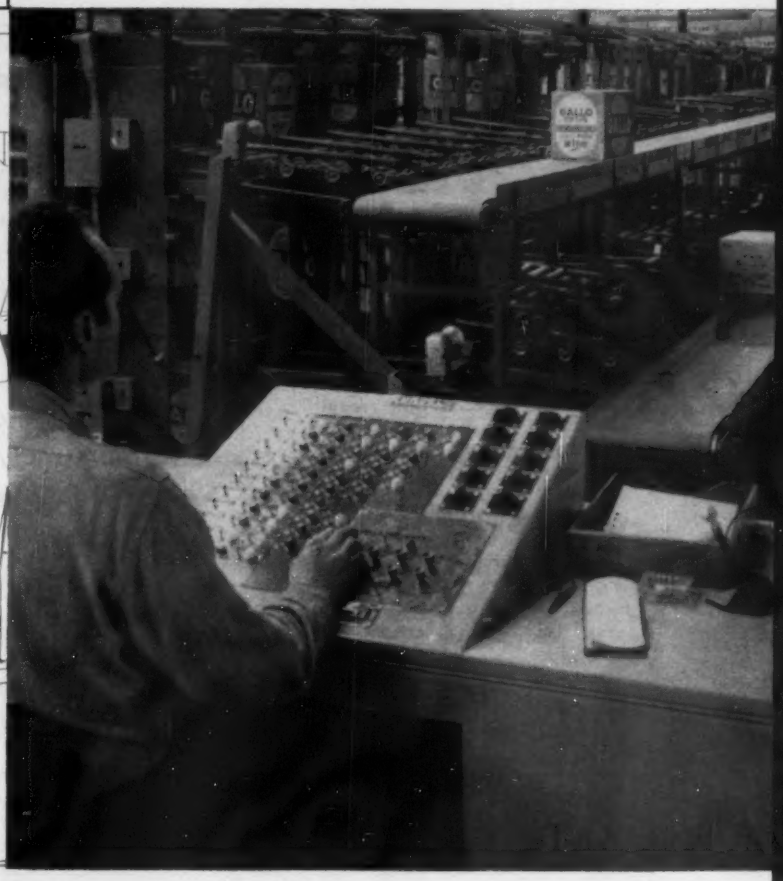
MODERNIZE NOW FOR GROWTH AND PROFITS



WE'RE PROUD OF THIS ISSUE. We think it performs a signal service to our industry.

It reveals the need for modernization . . .
Points up the degree of obsolescence . . .
Highlights high-productivity equipment . . .
Tells you how to finance modernization . . .
Explains how to spot profit-eating machines . . .
Tells you what pacesetters are doing . . .

We're proud, too, to be a part of an all-industry Plan '59 effort by McGraw-Hill magazines. This is a tremendous editorial service to industry and to country.

Months of work went into surveys, interviews, and other research to develop the facts—and to interpret and present them. And the wide range of expert knowledge of our several editors was brought into full play.

The highly significant, and shocking, article that follows this page was prepared by McGraw-Hill's Economics Department. One piece on financing modernization is by an outside authority. All other articles represent the teamwork of FE's editorial staff.

We hope it will be as rewarding to you as the preparation of it has been to us.—*The Editors*

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PLAN '59
GROWTH/PROFITS

How Modern

THE MODERNIZATION JOB AHEAD: $95 BILLION

The McGraw-Hill Department of Economics asked a wide sample of manufacturing companies, and experts in other industries, "What would be the cost to replace all obsolete facilities with the best new plant and equipment?" Here is a summary of the estimates. (Details on next page.)

MANUFACTURING AND MINING	$34.3 Billion
PETROLEUM INDUSTRY	5.3
TRANSPORTATION AND COMMUNICATIONS	18.4
ELECTRIC AND GAS UTILITIES	12.0
FINANCE, TRADE AND SERVICES	25.0
TOTAL: ALL BUSINESS	$95.0 Billion

The U.S.A. is starting a new period of economic growth, as we leave behind the recession of 1958. This new period presents a challenge to the nation, to the business community and above all to the individual company —to grow *at a profit.*

By now it is clear that growth is the normal way of life for the U.S. Economy. Since 1947, our national product has been growing at a rate of 3.7% a year. And no recession, even the latest and most publicized, has interrupted the trend for long. Now the economy is growing again.

But the conditions of growth are far different from those that prevailed in the year 1947 to 1957.

Today growth in the economy does not mean pressure on capacity, for most industrial firms. It does not mean easy profits. Rather, this is growth under highly competitive conditions, with profits dependent on a firm's ability to hold down costs. **Is our plant and equipment modern enough to do the job?**

A New Survey

To find the answers to this question, the McGraw-Hill Department of Economics has just completed a special survey of business needs for modernization. **The survey shows that it would cost $95 billion to replace today's obsolete equipment.** And this is a priority job, if business is to get costs down for the years ahead.

This tremendous need for modernization presents a challenge to the U.S.A. as a nation. The Communist powers are making a strong and disciplined effort to demonstrate that they can out-produce us–that they can "plow us under" in a contest of industrial strength.

It is a challenge to American business. Our people expect a continuously rising standard of living. Our workers expect wage increases. And often their demands mean price inflation – unless we can achieve sharp gains in output. The public demands higher national income without inflation. This is the challenge to business as a whole.

It is a challenge to the individual firm. Growth in the economy no longer means an automatic rise in sales and profits for any particular company. There are no shortages; industrial capacity is ample. So to participate in growth, the individual firm must achieve better quality or lower costs than its competitors. Otherwise, there will be no profit in growth and no success story for the company.

Is business prepared today for these challenges? The answer, from our study, is clearly "No". The production and distribution facilities of the U.S.A. are not efficient enough to ensure our continuing superiority over the Communist world, to match every wage increase with higher productivity, to do business in a competitive economy at satisfactory profit to the individual firm.

This statement sounds shocking at a time when much industrial capacity is idle and the recession just behind us is being blamed on a surplus of capital goods. But the facts speak for themselves. Here is the record on the past decade of investment in new plant and equipment, and here is our new study of the job that still remains to be done.

Decade of Expansion[1]

Since 1947, private business in the U.S.A. has invested $291 billion in new plant and equipment. Our manufacturing capacity has increased about 80%; electric power capacity,

[1] Figures on "Decade of Expansion" are for the years 1947-1957 inclusive, except where specific reference is made to preliminary data for 1958.

Is American Industry?

A Report by the McGraw-Hill Department of Economics

145%; capacity for basic raw materials, by 55%. The distribution and service industries have increased floor space by roughly 50% in the decade. In 1957 alone, business spent $37 billion on new plants and equipment—more than the combined expenditure in all of Western Europe plus Canada.

But all of this expenditure has not made our facilities as modern as supposed, or as modern as we need. Of the $291 billion invested by business since 1947, roughly $157 billion has been for expansion of capacity. Only $134 billion has been spent to replace old facilities with better, more modern equipment. And in recent years, this investment has not purchased as much new equipment as the dollar figures suggest, because prices of capital goods have climbed.

Our postwar capital investment has repaired the worst of the obsolescence accumulated during the depression and war years. But huge amounts of old equipment are still in use, (as shown by table at right). This is based on a survey of the age of manufacturing capacity in several hundred companies, representing all of the major manufacturing industries. Almost 50% of our present capacity was installed before or during World War II. More than 65% was installed before Korea. Expert studies of the major nonmanufacturing industries show that the age of equipment, in those industries, is even greater.

Thus, of all business plant and equipment, less than one-third is modern in the sense of "new" since 1950; two-thirds is pre-Korea.

This over-all figure is confirmed by a check on specific industries:

- Nearly two-thirds of our metalworking equipment was installed over 10 years ago, according to preliminary results of AMERICAN MACHINIST's 1958 census.
- Over 65% of the freight cars on our railroads are more than 10 years old.
- Less than half the capacity to process chemicals, rubber or petroleum is new since 1950—a period that has seen rapid development in such equipment as automatic controls for these process industries.

These examples take on a dollars-and-cents meaning when we recognize that the latest machine tools are about 40% more productive than 1948 models, and that a combination of new freight cars and modern freight yard equipment can reduce operating costs up to 50%. New instruments, that automatically direct the flow of a chemical (or other raw material) process, can often reduce processing costs enough to pay back the cost of the instruments in one year. These savings cannot be made in older plants. By using obso-

THE McGRAW-HILL SURVEY OF MODERNIZATION NEEDS

Conducted by the McGraw-Hill Department of Economics in August, 1958

INDUSTRY:	AGE OF MANUFACTURING CAPACITY Percent Installed: Prior to Dec. 1945	Dec. 1945 to Dec. 1950	Dec. 1950 to Dec. 1957	COST TO REPLACE OBSOLETE FACILITIES: Millions of $
Iron and Steel	47%	16%	37%	2,855
Nonferrous Metals	47	13	40	1,022
Machinery	41	21	38	3,224
Electrical Machinery	34	18	48	1,917
Autos, Trucks and Parts	42	11	47	2,204
Transportation Equipment (aircraft, ships, railroad equipment)	59	9	32	854
Other Metalworking	54	17	29	2,351
Chemicals	30	23	47	3,070
Paper and Pulp	49	17	34	2,655
Rubber	46	9	45	600
Stone, Clay and Glass	46	20	34	1,840
Petroleum Refining	45	26	29	1,499
Food and Beverages	58	19	23	3,443
Textiles	59	18	23	1,001
Misc. Manufacturing	51	21	28	6,236
ALL MANUFACTURING[1]	48	19	33	34,771

[1]Includes petroleum refinery companies listed under "petroleum industry" in previous table.

MODERNIZATION PAYS

the outmoded and unfair restrictions on rates of depreciation for tax pur-

lete facilities, our industries accept a waste in labor and materials that totals many billions of dollars per year.

Why Productivity Must Rise

The U.S.A. can ill afford this waste. In the economic struggle between the free world and Communist world, our margin of superiority depends on the efficiency of our productive facilities.

For the growth of our own economy, we shall need a sharp rise in productive efficiency. During the next ten years, American business must provide the goods and services required for a population that will increase by 32 million. And the increased population will expect higher living standards. Furthermore, the population in ten years will include a higher proportion of dependent persons—children and retired people—and a smaller proportion of working age men. Thus, with a relatively smaller labor force, industry must provide more goods for more consumers.

At the same time, industry must strive to hold the line against rising costs. In an economy with a tight labor supply, we cannot count on restraint in wage demands, however desirable such a development might be. In the past ten years, hourly wage rates have increased over 5% per year, nearly twice as fast as output per manhour. And this disparity may well continue—causing still more inflation—unless we make more rapid gains in productivity.

We can make these rapid gains—if industry goes all out to modernize its equipment. Output per manhour (in manufacturing) has increased only 2.5% per year since 1951. But this compares with gains of 4% a year in 1947-1950, and over 5% in the 1920s. Today the machines and techniques are available for us to equal, or exceed, these records—to raise output per manhour at least 5% per year. This is a job that can, and indeed must be done, to assure growth in the economy without inflation.

The Job Ahead

The dimensions of this opportunity are shown by the table on the previous page. In its survey on the need for modernization, the McGraw-Hill Department of Economics asked a wide sample of manufacturing companies how much it would cost to replace *all* their out-dated facilities with the best new equipment available. The Department also interviewed experts in each of the nonmanufacturing industries, to find answers to this question. The answers add up to a staggering bill for new plant and equipment.

Modernization of over-age facilities—replacing only what is really obsolete, by today's production standards—would require a total capital investment of $95 billion, or nearly $20 billion per year for the next 5 years.

Furthermore, new production techniques will soon make today's plants obsolete, in many cases. Thus, to keep pace with technical advance from 1958 on, will require continuing expenditures of $8 to $10 billion per year for modernization.[1]

The total expenditure to wipe out the backlog of obsolete facilities, and keep up with continuing technical advance between now and 1963, would be at least $135 billion.

The U.S.A. has never spent such a sum on the modernization of industrial facilities. Capital expenditures of boom dimension have, in the past, been associated only with the urgent expansion of capacity. **Some forecasters are now saying that because industrial capacity is adequate, the next few years will be a period of low capital investment. The figures above make clear that this would be a national calamity.** The opportunity is there—and the challenge—to invest record amounts of capital in the modernization of plant and equipment.

A National Problem

This also is a challenge to the U.S.A. as a nation. For 100 years, this nation has been looked to as the model of economic development by the rest of the world. For the first time, we face a serious challenge by another nation and another economic system that claims to be better. In a carefully documented 111 page study released in May, the U.S. State Department declared that "the most serious threat" to the U.S.A. today is the drive for economic supremacy by the Soviet Union.[2] Although a much smaller nation industrially than the U.S.A., the U.S.S.R. is today increasing its national output at a rate of 7% per year and its output per manhour by 4% per year.

The U.S.A. does not have to match these specific figures, which represent the results of forced labor in a country just starting to develop industrially. In the contest to win uncommitted nations, the statistics are not likely to be quoted exactly, in any case. But our over-all growth in national output and living standards must be so impressive as to leave no question of superiority. Our factories must be showplaces of modernization to the foreign visitor that will leave him unable to say "I saw much better" in Britain, or West Germany, or Russia.

This is the challenge to the nation —a political challenge to be sure. But it coincides with the challenge to the business community and the individual firm. And the way to meet it is the same: by thorough and rapid modernization of our plant and equipment — not by the slow and steady pace of recent years, but at an accelerated rate that reflects the greater pressure for output at lower cost.

Obstacles To Be Overcome

We must face up to the fact that real obstacles—both technical and financial—stand in the way of faster modernization. Some companies do not have the technical "know-how" required for the latest production techniques. Many more lack the financial resources. How can we overcome such obstacles, and speed up the replacement of old facilities?

In the course of its study, the Department of Economics obtained comments on these questions from many executives. One of the problems, as we noted above, has been the urgent pressure to expand capacity during most of the postwar period. In giving their attention to this problem, companies have sometimes overlooked the chance to modernize older plants.

In some cases, equipment has been kept in place because it was satisfactory, and the users were not aware of still newer designs. Some equipment users believe that equipment makers are not sufficiently aggressive in designing and demonstrating new models.

The biggest obstacle – and one that presents a persistent problem –is the shortage of funds in many

[1] This estimate is based on technical developments reported by McGraw-Hill editors and current price trends for capital goods. It is consistent with the plans for modernization expenditures in 1958-61 reported by companies in a McGraw-Hill survey conducted in April, 1958.

[2] "The Sino-Soviet Economic Offensive in the Less Developed Countries"—U.S. Department of State, May, 1958.

MODERNIZATION PAYS

Profits on modernization—like all business profits—have come down since 1955. However, modernization, in contrast to new capacity, still offers a relatively quick return on investment. Here are companies' answers to the question: "In cases where you are actually replacing old facilities with new plant and equipment in 1958—how soon do you expect these replacement expenditures to pay off?"

	PERCENT OF COMPANIES ANSWERING			
INDUSTRY:	1 to 2 yrs.	3 to 5 yrs.	6 to 8 yrs.	9 yrs. and over
Iron and Steel	11%	56%	11%	22%
Nonferrous Metals	29	71	0	0
Machinery	12	56	12	20
Electrical Machinery	29	57	7	7
Autos, Trucks and Parts	40	60	0	0
Transportation Equipment (aircraft, ships, railroad equipment)	7	53	20	20
Other Metalworking	38	33	10	19
Chemicals	10	53	21	16
Paper and Pulp	22	22	22	34
Rubber	33	33	34	0
Stone, Clay and Glass	0	57	36	7
Petroleum Refining	16	50	17	17
Food and Beverages	16	44	12	28
Textiles	37	47	5	11
Misc. Manufacturing	9	52	13	26
ALL MANUFACTURING*	18	50	14	18

*Note: Answers to a similar question, in a 1955 Mc-Graw-Hill survey, were as follows: 1-2 years: 17%, 3-5 years: 64%, 6-8 years: 11%, 9 years or more: 8%.

companies that need and want to modernize. For all corporations, the cash flow from retained earnings and depreciation has increased by more than $5 billion from 1953 to 1958. But a number of key industries have failed to keep pace with the general trend. **These include some of the areas where the need for modernization is most urgent: the railroads, large sections of the textile industry, some mining industries and many small to medium-size companies in manufacturing generally.** The problem of these industries and companies has grown more acute in 1958–since their profits have declined much more than the average for all business.

Any plan to step up the pace of modernization generally must deal with the special situation in these problem areas. Depressed industries and companies need outside help, if they are to modernize. Such help would include a stronger flow of technical information and advice (and occasionally, venture capital) from the more prosperous, inventive industries – as well as advice from equipment suppliers and distributors, industrial publishers and consultants. There is also a public responsibility to help in the problem areas–not with handouts of government money, but with technical assistance and help in finding private capital (like the efforts now being pursued by the Small Business Administration).

Certainly we should lose no time in reforming those provisions of the federal tax laws that now impede investment in modern equipment by hard-pressed firms – especially the outmoded and unfair restrictions on rates of depreciation for tax purposes. At present, the tax regulations require that depreciation be computed over relatively long periods of "useful life" for most types of equipment. And this is a primary reason for the lag in modernization. Machinery generally becomes obsolete long before the expiration of its "useful life" as specified in tax regulations. But it is difficult for companies–especially small companies–to set aside cash for rapid replacement, unless the full amount to be set aside is exempt from income tax. Canada and most European nations allow more rapid depreciation for tax purposes than does the United States.

A combination of self-help with technical help, and a fair break from the tax laws, would do much to reverse the spreading tide of obsolescence in depressed industries, and in many small companies.

Plan '59

It is this combination that McGraw-Hill advocates as "PLAN '59", to help business modernize now for growth and profits. This is what it will take to make a start in 1959 on the $95 billion job of modernization, disclosed by the study we have just completed:

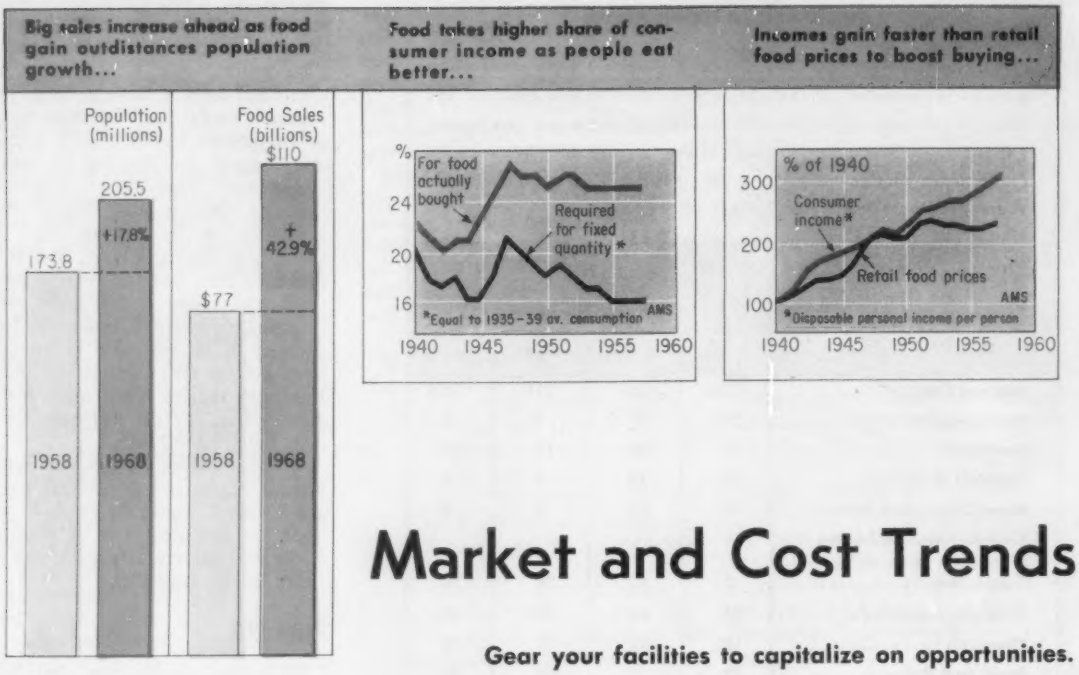
1. A better flow of technical information on where and how to modernize business plants and equipment.

2. Careful review by the individual company of its own opportunities to modernize at a profit–then action to replace obsolete facilities.

3. Reform of the tax laws, to allow more realistic deductions for depreciation, and permit more companies to finance adequate modernization programs from this source of funds.

Much of this program is already underway. The 34 McGraw-Hill Publications, and many suppliers and distributors of industrial equipment, have stepped up their information programs to start the modernization drive. Preliminary plans of manufacturing companies show a strong emphasis on capital spending for this purpose. In August, Congress passed a bill providing limited tax relief for small business.

But the real task of modernization still lies ahead. It is the greatest challenge, and the greatest opportunity, confronting American business as we move forward into 1959.



Market and Cost Trends

Gear your facilities to capitalize on opportunities.

JUST LOOK at the trends and you see why further modernization is urgent. The curves reveal greater sales opportunities for alert food manufacturers. And they prove that productivity must be increased to offset rising costs and protect already slim profit margins.

That there is great opportunity to improve efficiency and productivity is spotlighted by the high degree of obsolescence of food plant equipment—half of it is over 10 years old.

Few food companies can afford the high cost of failure to modernize those obsolete operations which offer good return on the investment. And a systematic study of the economics of updating each operation in your plant will reveal plenty of opportunities.

Look at it another way. Suppose you don't step up productivity starting next year. Then your costs will increase appreciably, either reducing your slim profit margin dangerously or increasing your prices above those of more progressive competitors.

This will impair the existing marketability of your products. What's more, you will not be capitalizing on the opportunity for larger sales offered by a rapidly growing population and a faster growing demand for processed foods, particularly for convenience and quality items.

Let's look further into increasing costs. Average wage rates in food plants have hit a new high of $2.01 an hour. And the trend in contract settlements in 1958 has been to 10 or 11¢ an hour increases with additional fringe benefits. Then your social security payments go up about $25 for a worker making $4,800 a year, in 1959, with further boosts later. And in figuring labor costs, don't forget to include fringe benefits. These are reaching toward $1,000 per employee per year.

You can count on higher costs for most containers and packaging materials and supplies, too. Remember that the price of steel has been upped. And consider that further inflation is almost a certainty, spelling steadily increasing costs all along the line.

Prepare for More Business

Let's go deeper into your greater sales potential as a need for modernizing. Retail food sales have been running about 9% ahead of last year, chalking up a nice gain in a recession period. Estimating a more conservative increase for the year, total food sales are expected to come close to $77 billion for 1958. This will amount to a $5.3 billion boost in two years.

Underlying this upsurge are several factors. Basic, of course, is the rapidly increasing population. Today, population is 173.8 million. In 1968 it will be 205.5 million. Then the self-feeding farm population is steadily decreasing, with those remaining on farms buying processed foods to a greater extent each year.

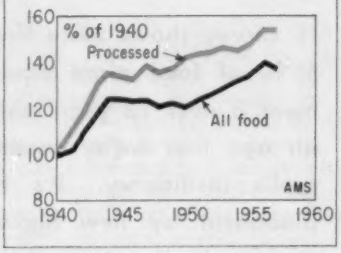
To efficiently process and package the extra food required to meet these trends will require the addition of modern facilities.

Personal income is rising, and will continue to do so. For the first 7 months of 1958, it amounted to $350 billion at an annual rate, or $4 billion more than in the same period of '57. And it is forecast at $475 billion in 1968.

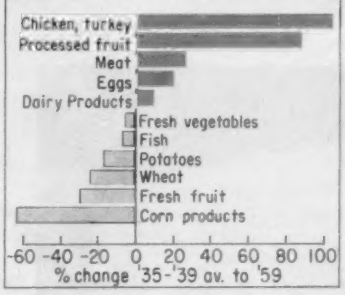
The trend has been for food expenditures to increase as consumer income rises. And food buying habits point to a trend to finer living through better eating.

Time-saving convenience foods and packages have won strong and permanent consumer favor. Typical

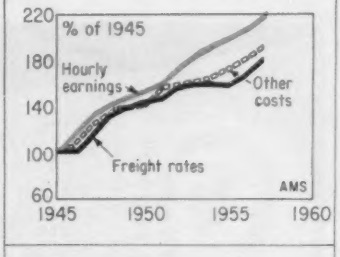
Processed foods up more in sales than all food in long-time trend...



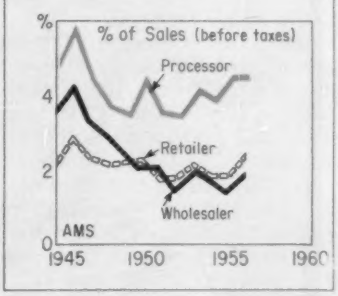
Quality-and-convenience demands change per capita consumption of major items...



Meanwhile, costs rise in trend that demands higher efficiency...



And profits slump to slim margins that call for lower costs...



Call for Modernization

And offset rising costs by stepping up productivity

convenience items increased 122% more in sales over a 5-year period than conventional counterparts.

Quality is another reason for more dollars in the food basket. People are eating more dairy products, meats, and eggs, and less cereals and potatoes. Even gourmet foods are gaining nicely.

FE's study of food buying in the recession showed practically no downgrading in convenience or quality. Is your plant equipped to serve the demand for convenience and quality items?

On top of all these factors is a steady increase in consumption of processed foods compared to unprocessed. Convenience is the principal reason. Gains in both frozen and canned items demonstrate this point. And here are other examples: though potato consumption has been declining per capita, sales of potato chips have zoomed. Fresh apples have been slipping in popularity, but apple sauce and pie mixes have been gaining. To get your share of the growing market for processed foods, you have to have the right processing facilities.

Adding convenience value by extra processing boosts sales, too. Take the popularity of cake mixes compared to the separate conventional ingredients for making cakes. And consider the fast gaining instant coffee.

It pays to add more value in manufacturing and packaging, value often referred to as built-in maid service. Therein lies greater opportunity for food manufacturers, along with premium quality at a reasonable price. Both not only have good sales potentials, but can up profit margin.

There is a growing demand, too, for products specially prepared through portion control and built-in chef service for economical institutional use. Here is a $17 billion market—reaching for $20 billion.

Much business can be done, too, in Oriental and Italian foods—packaged to be eaten economically at home instead of in restaurants.

Another rapidly growing market is the vending machine business. Are you prepared to serve it with the type of products required?

And are you watching the growing foreign market potentials for American processed foods? Several leading food companies are taking advantage of better eating in European and Latin American countries as standards of living rise and supermarkets increase in numbers. Some are exporting from plants in this country. Others have built, or are building, factories abroad.

You can't capitalize on marketing opportunities unless you gear your plant to do so, and efficiently. Nor can you defend your business against domestic competition nor against quality foods imported from abroad. You may even lose vital space on some supermarket shelves.

Will Cost More Later

Don't wait to modernize until your profit picture has improved. It isn't likely to improve, not until you get cost down and improve product marketability through modernization.

Don't postpone investing in greater productivity because you believe cost of plant and equipment to be too high. You will pay more for the same facilities later. Food equipment costs will be higher within a year, probably by about 5%.

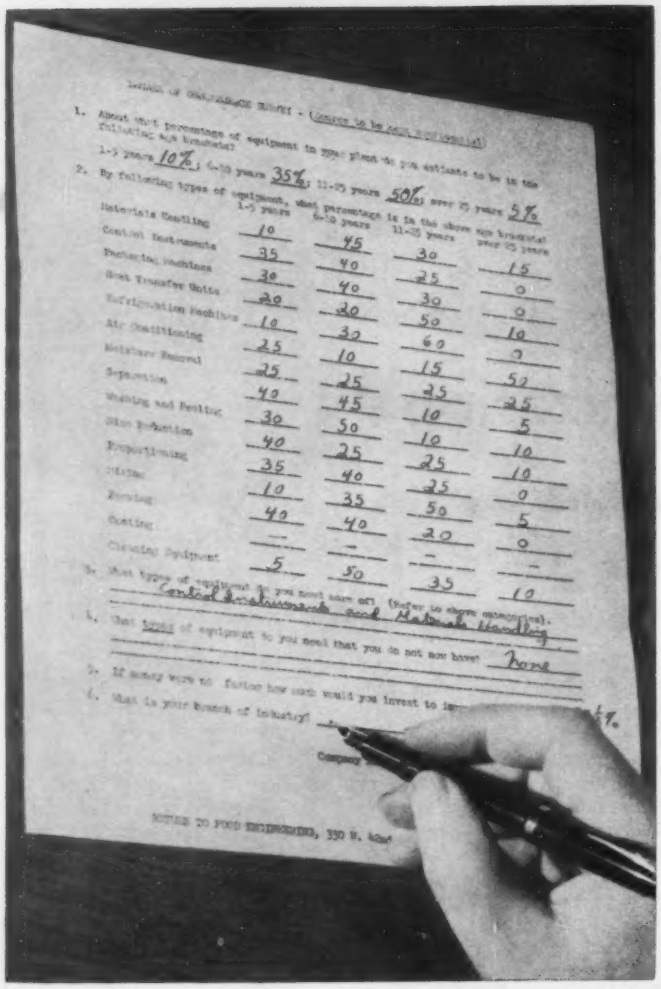
And between now and the time general business is again normal, perhaps in early '59, you will have quicker delivery, better service, and in some instances, lower charges.

So PLAN '59. Modernize NOW for growth and profits. —End

PLAN '59 GROWTH/PROFITS

Food-Plant Obsolescence

FE survey shows more than 50% of food plant equipment is over 10 years old—an age that today usually spells inefficiency. It's replacement by new higher-speed units is seen essential for profitable operation


1. About what percentage of equipment in your plant do you estimate to be in the following age brackets?
1-5 years 10%; 6-10 years 35%; 11-25 years 50%; over 25 years 5%
2. By following types of equipment, what percentage is in the above age brackets?
Materials Handling 10 45 30 15
Control Instruments 35 40 25 0
Packaging Machines 30 40 30 0
Heat Transfer Units 20 20 50 10
Refrigeration Machines 10 30 60 0
Air Conditioning 25 10 15 50
Moisture Removal 25 25 25 25
Separation 40 45 10 5
Washing and Peeling 30 50 10 10
Size Reduction 40 25 25 10
Proportioning 35 40 25 0
Mixing 10 35 50 5
Forming 40 40 20 0
Cooking — — — —
Cleaning Equipment 5 50 35 10
3. What types of equipment do you need most now? Control Instruments and Materials Handling
4. What types of equipment do you need that you do not now have? None
5. If money were no factor how much would you invest to improve
6. What is your branch of industry?
Company
LETTER TO FOOD ENGINEERING, 330 W. 42nd

QUESTIONNAIRE details degree of obsolescence of various processing units.

FOR THE LAST SEVERAL MONTHS, FE editors have been busy spotchecking food manufacturers and equipment makers to determine the degree and nature of obsolescence of food plant machinery. In addition, questionnaires were mailed to more than 300 food companies.

• **The results are in—and they're both revealing and shocking: Too much equipment in the industry is too old or obsolete to perform with the necessary high degree of productivity.**

Obsolescence is eating so heavily into profits that investment in new units has become vital—and will pay quick dividends.

While age of equipment is not always a measure of its obsolescence, it certainly is a good general indicator. A machine is obsolete, of course, the moment a new one is *available* that will do the job much better and pay dividends on its cost.

The payoff may come in savings in labor or materials, reduced downtime and maintenance expense, less-costly cleaning, better product quality, increased capacity, or a combination of these.

Certainly any machine more than 10 years old is suspect.

That word "available" in our definition encompasses any true improvement recognized by the user. Many pace-setters in the industry conceive, design, and even build, better equipment when they are unable to buy it. You cannot depend entirely on machine builders to come up with what you need. After all, they don't know your operation shortcomings as well as you should.

Equipment manufacturers have been critized by some in the food industry for not developing sufficient improvements often enough. And companies, in turn, have been criticized for not having the technical savvy to properly evaluate the benefits of new equipment offered to them. Let's grant that there is some truth in both views on the question.

The modern concept calls for equipment that performs several operations in one machine. An example is packaging equipment that forms, fills, and seals containers automatically, and at high-speed.

Piecemeal Improvements

Many of our food operations and processes are still carried out in the traditional way. Some of these techniques are shockingly inadequate when compared with certain advanced unit operations in other branches of the food industry and in other fields.

This situation is not particularly surprising. For our factories originated as over-sized kitchens, with "pot-and-kettle" techniques. Gradually more efficient mass-production methods were introduced, and espe-

Is Disturbingly High

cially since World War II have operations been streamlined by advanced engineering.

Unfortunately, but perhaps unavoidably, much of the improvement has been made in piecemeal fashion. Today, the average food factory is a mixture of the latest and the antiquated, the latter pulling down the average performance and, in many cases, constituting productivity bottlenecks.

You can no longer economically install different units piecemeal–to be hooked up to other units with conveyors, or pipelines.

A filler is no linger an "independent" packaging machine. It must be thought of as part of a system, to be selected and installed according to a carefully engineered plan.

Even current models of traditional machinery may be obsolete. This is true when better ways of performing unit operations offer opportunities to revolutionize a conventional process.

Spotcheck Results

In the survey, plant equipment was divided into four groups according to age–1-5 yr., 6-10 yr., 11-25 yr., and over 25 yr. (see questionnaire, left).

The results show that, for the industry as a whole more than 50% of the equipment is over 10-yr. old. And, although much of it was built to last 10-15 yr., the greater efficiency of new units makes extensive equipment replacement virtually mandatory.

If we are to keep pace with rising costs and increase productivity so that an adequate profit is insured, we must replace the older equipment–and fast.

A large proportion of the packaging, heat transfer, refrigeration, size reduction, and mixing units were found to be 11-25 yr. old.

Practically every plant operator expressed a need for more automatic materials handling equipment. Bulk handling of liquid and dry materials is becoming essential to profits, as is unit-load handling of finished products in cases.

Other units frequently mentioned as sorely needed were:

Mixers, depositors, coating, and size reduction machinery by confectionery manufacturers.

High pressure boilers, high-speed can lines, and automatic controls by canners.

Packaging, heat transfer, refrigeration, separation, and size reduction equipment by meat packers.

Packaging, automatic controls, and air conditioning by bakers.

High-speed can and bottle filling, and packaging equipment by brewers.

Better packaging and coding machines, more automatic controls by dairies.

Encouraging was the plant operator's awareness of need for more and better materials handling equipment. For this area offers an outstanding opportunity for cost cutting.

As an example, one soft drink manufacturer effected a saving of 52c. per 100 lb. of sugar by switching from bags to bulk handling. And a baker saved 32c. per 100 lb. of flour by a similar change.

Comparable benefits are possible through handling and shipping cases of finished products in unit loads, and by pushbutton and automatic order make-up in warehousing.

In other areas, faster, better integrated, more trouble-free packaging equipment is available to break production bottlenecks, save man-hours, cut down-time, and reduce breakage.

More accurate fillers and fill-checkers will effect big savings by cutting down product give-away.

New steam-injection processing units offer efficiency and product quality advantages, as do advanced size reduction and separating machines. Heat processing can be advantageously combined with size reduction in some cases.

Mechanized cleaning of plant and equipment can greatly reduce the high cost of sanitation.

Pace-Setters Spend "Big"

Some companies have set the pace by large scale modernization of plants and equipment. They have employed huge sums taken out of net earnings in addition to depreciation allowances.

These companies account for a large part of the estimated $736 millions that are being spent this year on modernization.

Some of these companies have replaced obsolete plants with brand new facilities. They have attained top efficiency by designing the plants to utilize the latest equipment and production techniques.

Others have successfully upgraded their present plants by installing large numbers of advanced units. In addition, these companies have replaced obsolete plants.

The wisdom of their policies is demonstrated by the increased sales and earnings posted in recent years in spite of higher labor and materials costs. (See "Case Histories Reveal Modernization Pay-Offs," p. 60.)

But for the food industry as a whole, pertinent action is called for—as indicated by these pointed off-the-record comments from leaders in various branches:

"In meat processing, labor costs are excessive. Modern equipment can reduce them more than 50% in a lot of plants." (It is estimated that meat packing plants alone now need $200 millions in new facilities.)

"In candy plants, unit labor costs could be reduced up to 50% in manufacturing, and up to 75% in warehousing and shipping with the most modern equipment."

"Additional modernization of nut processing could cut labor costs 10-15% in the plant, 20-25% in warehousing and shipping."

"The canning field should spend 10-20% more for moderization than it did in 1957. Costs could be cut 10-15% in manufacturing, 10% in warehousing 5-10% in shipping."

"Winery labor costs could be cut 10-15% with modern manufacturing, warehousing, and shipping equipment."

Although food manufacturers maintained capital investments at a relatively high level during the recent recession—$736 millions compared with $749 millions in '57—it will take much more to keep productivity in line with increasing costs, and to gear the industry to marketing trends and opportunities.

FE's obsolescence survey indicates that more than $1 billion should go into modernization in '59–better then a third more than the '58 figure. And a similar bolstered investment in progress will be needed in each of the next few years.

Food Men Damn Obsolescence

Sharp and shocking points by responsible men in the industry

Modern Mixed With Antique

"UP-TO-DATE OPERATIONS—surrounded by others still in the dark ages. That you will find in any food factory.

"Certain equipment manufacturers concentrate on improvement and get far ahead of the field. We have greatly improved continuous cooking equipment, but to prepare material for it we must have batteries of women performing trimming and inspection operations.

"Our greatest problem is one of coordination—or systems engineering.

"Probably the two most undeveloped areas are materials handling in its various aspects, and inspection and testing."

Antiquated Ideas Obsolete the Designs

"MUCH FOOD PLANT equipment now is obsolete because of its antiquated design—and the antiquated ideas behind the designs.

"The modern concept calls for equipment that performs several operations in one machine. For instance, a new machine built for a petroleum company opens the case, fills the containers, applies tamper-proof seals over the container mouths, screws the caps on, then closes and seals the case. This is done in one operation—without an operator."

Can't Appreciate Potential Gains

"WE HAVE ENCOUNTERED a serious problem in selling new and improved equipment to food companies. It is the lack of technically trained personnel who can appreciate and evaluate the gains which may be possible through the use of improved equipment and processing methods."

Fallacies in Pay-Out Philosophy

"MANAGEMENT is overlooking two important factors in modernization: (1) Labor rates will not remain static—labor always goes up. (2) At the end of the replacement period, the cost of a piece of equipment will be much greater than today's cost.

"Therefore, equipment pay-out time should be based on average cost of replaced equipment (based on the cost today and that at the termination of the wash-out period).

"A too conservative rate of depreciation can spell disaster not only to a company but to a nation. The low rates formerly taken in Great Britain, both for book and tax purposes, have unquestionably contributed to the technological backwardness of industry in that country."

Meat Operations Extra Obsolete

"THERE IS little doubt that most meat packing plants are quite obsolete. But there is a lack of equipment with which to modernize. New equipment, yes. Modern, no. Engineering has not kept up with the times in our field.

"Meat packing still is fundamentally a handicraft operation. The basic operating unit is a man with a knife. A major breakthrough is necessary to effect any real change.

"Labor costs are excessive. Modern equipment can reduce them more than 50% in a lot of plants. Meat packers should spend $200 million now for modernization."

"So Crude and Inefficient"

"BETWEEN 75 AND 85% of meat plants can be characterized as "traditional operations so crude and inefficient that really great improvement could be effected by re-engineering the processes.

"These operations require immediate study: (1) Heat exchange and transfer. (2) Meat cell diffusion characteristics. (3) Materials handling."

Candy Plants Need Overhaul

"CHOCOLATE PLANTS could benefit very considerably by the development of automatic, high-speed equipment not yet available. Forming and packaging of small consumer items require a lot of labor.

"The candy business also has a great deal to gain by further modernization with respect to equipment presently available. This branch of the industry has done a very poor job of keeping up to date with the latest cost-reducing opportunities.

"This is why imported confections can compete so favorably with items made in the USA."

Tremendous Mortality

"IN THE PAST 5 to 10 years, candy manufacturers have found that they can't increase price to cover the rising cost of labor and materials.

"It is obvious, then, that they must cut costs of labor through mechanization.

"There's been tremendous mortality in the business. A lot of firms have fallen by the wayside because they're sitting tight and keeping investments down. To stay in business in a low-margin field like this, it's imperative to mechanize and modernize.

"Key unit operations that need a good overhauling are cooking and packaging. Cooking should be made continuous (more so than now). And instruments would make operations more automatic to produce uniform quality items at a saving."

in Off-the-Record Comments

Presented here anonymously so no punches need be pulled

Bakeries Modernize to Stay Solvent

"IF BAKERS are to remain solvent, it is urgent that they modernize to meet rising production costs. We are thinking of automation, such as conveyor handling systems for packaged products, continuous mixing processes, and automatic cooling.

"Plants which have been progressive in this respect have saved 8 to 15% in labor cost."

Divert Dividends, But Modernize

"MANAGEMENT conservatism impedes modernization. Some companies should divert dividends into modernization for two or three years to reap big rewards and strengthen the company.

"Bakers would benefit if equipment manufacturers further modernized some of their machines. They should add automatic loaders and unloaders to ovens. and pull standard machines together physically to get more production.

"If a bakery is to stay in business today, it must give customers the best possible values. To do this, it must reduce costs. There's only one way: Replace obsolete high-cost machines with new ones that do more in less time, with quality assured by controls rather than by human skills.

"Plants should modernize now by at least 10%."

Could Cut Soup Costs 50%

"WE ESTIMATED that overall costs could be reduced 50% in our packaged dehydrated soup operation. Big savings were accomplished through heavy investment in new packaging machines to eliminate a major bottleneck.

"Other potential savings are 5 to 10% by improving cooking; 10% in materials handling (less modern plants could save 25%), and 50% in mixing and drying.

"About 50% of net earnings after taxes should go into new equipment."

Modernizing Urgent for Macaroni Plants

"NEED FOR modernization is extremely urgent in macaroni products plants that have not followed a realistic policy of purchasing new developments in packaging and production machinery.

"Those that have fallen behind find that they now have to spend more than they would have 5 to 10 years ago. They also have lost the profits that they could have accrued by using labor-saving machinery.

"Modernization is most needed in materials handling and the application of automatic controls to production and drying processes.

"Plants in our field should spend at least 10% of their total machinery investment for new machinery each year—$5 million per year for 170 plants.

"Several plants could reduce labor costs as much as 40%, because cost per pound of product ranges from a high of 1.8c. to a low of 1.1c."

Canning, Freezing Behind Times

"CANNING AND FREEZING plants have been slow to keep up with the times, as compared with other industries. They need modernization.

"With inflation, manufacturers have been able to cover costs by raising prices. But this should be reversed. Plant and process modernization is the one way to obtain the efficiency needed.

"Or field should spend 10 to 20% more for modernization than it did in 1957. Costs could be cut 10 to 15% in manufacturing, 10% in warehousing, and 5-10% in shipping.

Should Double Capital Expenditure

"REDUCE DIRECT labor costs, improve product quality, get more uniformity of finished product, and improve financial conditions. Those are the benefits that will come from further modernization.

"And modernization is urgent to achieve these results in the canning field.

"Canners should spend twice as much for capital improvements to keep pace with other industrial developments and with competition from other foods.

"Unit labor costs could be lowered by 10 to 20%."

Dairy Modernizes for Profitable Products

"WE ARE MODERNIZING our dairy operations extensively to effect a shift in product lines—away from butter to more profitable items, for example. And we are investing in increased output per man-hour by providing a maximum number of mechanical assists to up productivity of workers.

"Modernization is rather urgent. We must be extremely efficient to compete with the dairy co-ops, and because of the trend to processing by supermarkets."

Wineries Must Modernize or Close

"MODERNIZATION certainly is urgent in the wine field. Unless a concerted effort is made to make plants conform to "Pure Food" requirements, some may be closed and adverse publicity will result. This applies mostly to grape receiving and handling, fermentation and storage cellars, and handling of waste products.

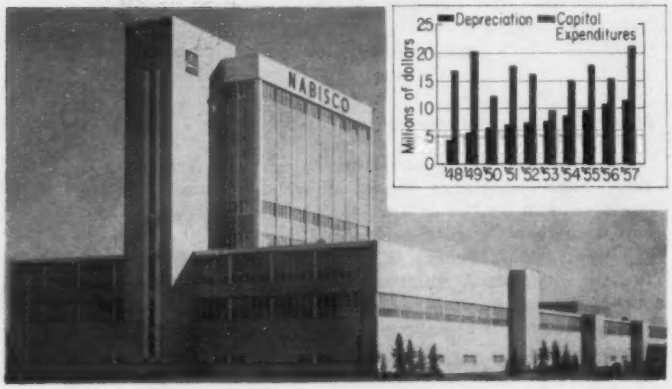
"Labor costs could be cut 10 to 15% with modern manufacturing, warehousing, and shipping equipment."

PLAN '59 GROWTH/PROFITS

Case Histories

Pacesetting food companies spend huge amounts on new plants and equipment. That's how they are able to maintain, and even boost profits in spite of increased labor and materials costs

National Biscuit Co. Sees Modernization a Must



"YOU CAN'T AFFORD NOT TO MODERNIZE." That's the philosophy of National Biscuit Co., whose capital expenditures between 1946 and '57 exceeded $171 millions.

Here top economy has been achieved by increased efficiency of operations made possible by plants of new design, able to utilize the latest equipment and techniques.

In 1946 the company operated 25 cracker bakeries. Since then obsolete plants either have been sold, drastically modernized, or replaced by new units—5 in U. S., 2 in Canada. Operations are now concentrated in 10 bakeries.

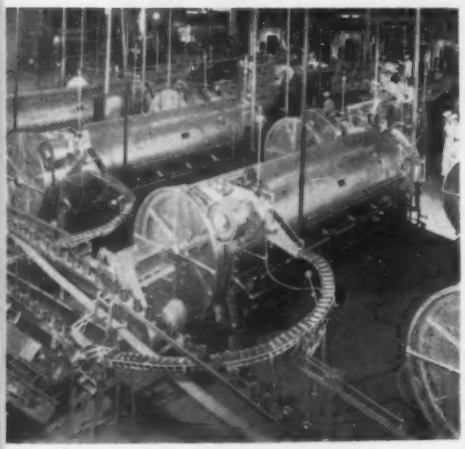
Bulk transportation and storage of flour, sugar, shortening, and other ingredients, together with automatic handling and mixing equipment, have greatly reduced time and cost in handling and assembling these materials. Substitution of band ovens for the old reel type, and development of automatic packaging equipment have increased production and lowered unit costs.

Completion of its new Fair Lawn, N. J., bakery and the adjoining new research center, believed to be the finest in its field, has brought a tapering off in the NBC large-scale plant improvement program. However, 1958 capital expenditures are set at $12 millions—50% for buildings, 50% for new equipment.

As a result of the large modernization program, sales have increased from $296 millions in '48 to $424½ millions in '57 — approximately 43¼%. Earnings of $22.1 millions in '57 were 8.7% above '56.

Funds for the modernization of domestic plants came entirely from operations and working capital.

The company continues to introduce new and improved products and packages. In 1957 alone 9 new varieties of crackers and cookies reached the market.



Libby Improves All 47 Factories

DURING THE PAST 10 YR., Libby, McNeill & Libby spent more than $50 million for equipment to modernize its 47 plants—with its latest full year disbursement (1957) put at $6¾ million.

The company's expenditure of $28.8 million over the last 5 yr. represented 120% of earnings.

Benefits include improved customer service brought about at company plants by better warehousing facilities, which replace outside storage. Also there has been a reduction in storage costs.

In the 10-yr. period 1949-'58, sales advanced from $153¼ to $296 million.

New products introduced last year included deep-minted pineapple chunks, frozen orange drink, two precooked frozen dinners, new baby food juices, vegetables, and desserts.

Company placed heavy emphasis on research at 7 divisional labs in the U. S., Hawaii, and Canada. These three phases were particularly accented: (1) Manufacturing research for better processing to improve quality; (2) new product development; and (3) agricultural research on seeds, soils, and plant foods.

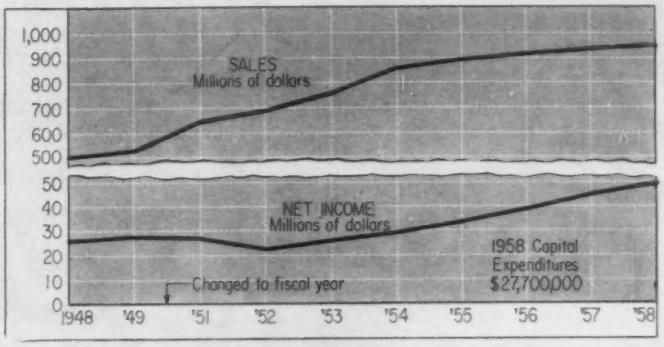
Reveal Modernization Payoff

HERE ARE ACTUAL-CASE YARDSTICKS against which to measure the adequacy of your own modernization efforts—brief case-histories highlighting the achievements and plans of food-field pacesetters.

FE editors surveyed these companies to get the facts about recent and planned capital expenditures, types of facilities purchased and benefits realized.

Other firms, including yours, might be doing as much, or more, but it's a good thing to know how your company stacks up against progressive firms such as those cited here. These leaders have been able to cut costs, improve product quality and service, and successfully meet or out-distance, competition. And their plans call for more of the same.

General Foods Invests $100 Million in 5-Yr.



"CARRY OUT OPERATIONS in the most efficient manner that modern technology and methods can achieve, consistent with a reasonable return on capital investment," is General Foods' concept regarding modernization.

In the 5-yr. period 1951-'56, this company's capital expenditures ran $100 million. In fiscal '57 it spent $29.3 million, and in '58, $27.7 million.

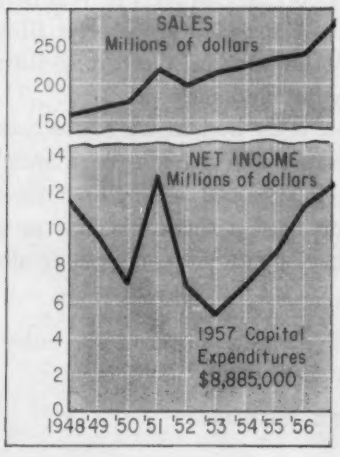
Of the '57 expenditures, which were 56% of the net earnings, 20% were for buildings, 73% for new equipment. Major outlays were for warehousing, plant buildings and sites, manufacturing equipment and machinery, office equipment, and motor vehicles.

The company has benefitted in many ways, such as: (1) Improvements in working conditions through installation of additional safety, sanitation, and air conditioning equipment; (2) better customer services through additional warehousing and other facilities that speed delivery of fresher products; and (3) progressive promotion of public relations, creation of new jobs, and better working conditions.

In the 10-yr. period 1949-'58, company sales increased 120%—from $494 million to $1,088½ million. In the same period, profits rose from $24 to $48 million. These earnings provided funds for both dividends on company stock and capital expenditures to improve facilities.

During the last year the company introduced 4 new products, 7 new frozen food entrees, 5 new flavors of existing products. Continuing its diversification, the company added S.O.S., maker of soap-impregnated scouring pads.

Further, it completed the new research center at Tarrytown, N. Y., which employs more than 500 persons. This is said to be "the largest and most modern food research facility in the world."



Calpack Keeps Plants Efficient

"IT IS OUR POLICY to maintain plants and equipment as modern as indicated costs justify in view of available funds for capital expenditures."

This is the modernization philosophy of California Packing Corp., an organization that spent almost $35 millions on capital improvements in the 5-yr. period 1952-'56.

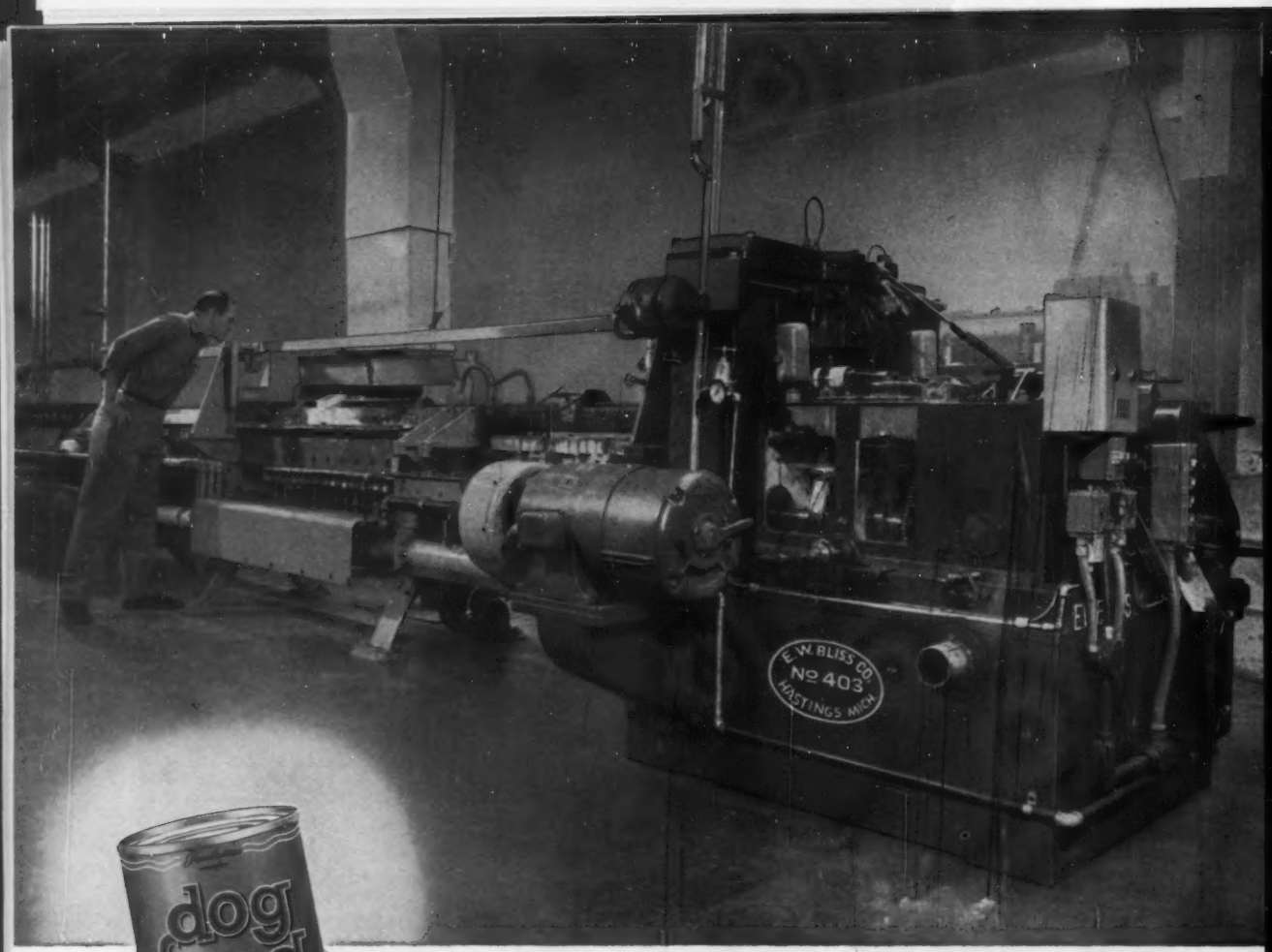
Its 1957 expenditures were $8,885,000.

Budgeted for '58 is $5,790,000, and planned for '59 approximately $5 million.

Expenditures for '57, which represented 105% of net income, were as follows: Buildings, 20%; new equipment, 70%. Principal improvements were installation of can-making facilities in three plants, a warehouse unit, and a juice concentrating plant in the Philippines.

In the 10-yr. period 1949-'58, sales went up 92½%—from $169 million to $325 million. The company estimates that dollarwise its sales rose $1.92 for each $1 of capital expenditures during the period.

Expenditures are financed from earnings and long-term borrowings. Further, the firm leases certain office machines, motor vehicles, and materials handling equipment.



DOGFOOD... *with a touch of* BLISS

To make more pet food cans, Consolidated Can Company of Whittier, California, an EKCO Products subsidiary, installed a complete Bliss automatic can making line in 1956. Within months, the first all-Bliss line had proved so successful that they installed a *second.*

One of the key machines in the line is the bodymaker above . . . a machine capable of turning out approximately 450 can bodies per minute!

Could you use production like this in your can making line? Bliss equipment can help you. Whether you need a single machine or a completely built and equipped "turn-key" plant, get complete details from Bliss.

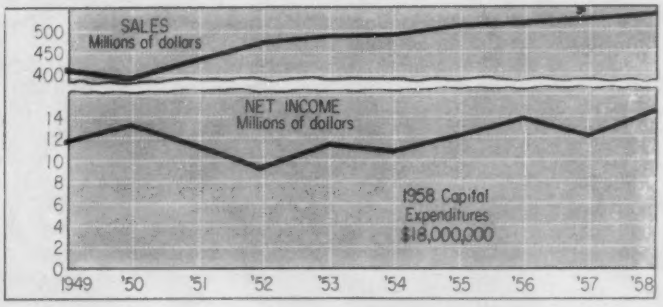
BLISS
SINCE 1857

E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name . . . it's a guarantee

PRESSES • ROLLING MILLS • MILL ROLLS • DIE SETS • CAN MACHINERY • CONTRACT MFG.

General Mills Spends $90 Million



"TO TAKE ADVANTAGE of technological developments as rapidly as good planning, good engineering, and sound financing will permit"—that's General Mill's philosophy with respect to modernization.

The company has backed it up with a $90 million expenditure for new plants and equipment over the last 10 yr. Further, it plans to spend $18 million in 1959, and a similar amount in '60.

Of the '58 expenditure, 70% was for equipment, 30% for buildings. In the past 12 months the company completed new cereal lines, a push-button feed mill, new baking mix facilities, and a new general office building.

A cake mix plant, flour mill, and the company's central research laboratories are currently being enlarged. And construction has begun on a new refrigerated foods plant, another feed mill, and two new dog-food facilities.

Company has benefited in many ways from these expenditures. Management costs have been reduced, output per man-hour increased, maintenance, sanitation, and distribution costs have been cut, and working conditions improved.

Customer service has been augmented by better distribution methods, such as bulk delivery of flour to bakeries and stocking of complete lines of products at numerous locations for direct shipment.

Of major importance is the effect of capital expenditures on sales and profits.

In the 10-yr. period 1949-'58, sales rose 29%—from $410.6 to $529.8 million. Earnings rose from $11.6 to $14.7 million.

Since, for example, the '58 expenditure of $15,859,000 represented 137% of net income, the company has found it advisable to finance improvements in three ways:

It reinvested $6,737,000 of earnings, utilized $6,300,000 of depreciation allowances, and borrowed $10 million from Prudential Insurance Co. Latter money was used for improving facilities and to increase working capital.

The company continued its diversification with introduction of seven new Betty Crocker mixes. During fiscal 1958 production of package foods climbed 3% and now represents 33% of sales.

Its modernization philosophy is expressed by President Ogden A. Geilfuss: "In this era of swift and drastic changes, we shall continue to place our internal house in order. This means further modernizing of our plants, fleets, manpower, products, packages, and marketing."

Southern Bakeries Reaps Higher Profits

NOW WELL ADVANCED is Southern Bakerie's most extensive program of plant modernization in the company's 33-yr. history.

Its capital expenditures for the 3-yr. period 1955-'57 were $500,000, $600,000, and $650,0000, respectively. And the company plans to spend somewhat over $1 million this year.

Among improvements at its 17 bakeries were installation of bulk-flour handling equipment, automatic ovens, cooling conveyors, mixers, dividers, and overhead proofers. Also, bread wrappers, slicers, cakemaking and wrapping machinery.

These have brought impressive gains in production speed and economy, as well as improved product quality.

For example: The bulk systems installed in two bakeries cut the flour-handling costs 25-32c. per 100 lb. Automatic ovens and auxiliary equipment stepped up bread production from 60 to 100 loaves per min. And a new 5c. cupcake wrapper in one plant has enabled two shifts to do the work of the previous three.

SB attributes its improved profit showing—up from $325,500 to $609,400 in 3 yr. with a rise in sales of about $1 million—to the territory-wide program of plant and equipment modernization.

Improvements were financed largely by a $2 million loan.

Anheuser-Busch Sees Benefits Pyramiding

"WE INTEND TO COMBAT increased cost of labor and materials by further increasing efficiency in production. To this end we have approved capital expenditures which are relatively heavy. But we believe these expenditures will pay off over and over again for years to come in increased efficiency and production."

This is Anheuser-Busch's philosophy regarding modernization. Since the end of World War II, this company has invested $115¾ millions in new breweries, replacements, renewals and plant expansion for beer and other food products. (Turn page)

Capital expenditures of $5.6 millions in '57 represented, in the main, replacement of worn out equipment and that which became obsolete due to new inventions and improvements.

Expansions in '57 included land for the 500,000-bbl. Tampa, Fla., brewery, on which construction was started Feb. '58. Also, in Feb. '58, the company purchased a 400,000-bbl. brewery in Miami.

Sales of its new beer, Busch Bavarian, introduced in 1955, increased 14% in '57 over '56. Further, the new vitamin product, Vita Busch$_{12}$, for fortification of cereals, baby foods, bakery and dairy products is now in production.

Over the 10-yr. period 1948-'57, sales rose from $122.8 millions to $227¼ millions.

Swift Spends 145 Percent of Profits

EXPENDITURES for new buildings and equipment made by Swift & Co. during the 10-yr. period 1948-'57 amounted to approximately $300 millions—145% of net profits.

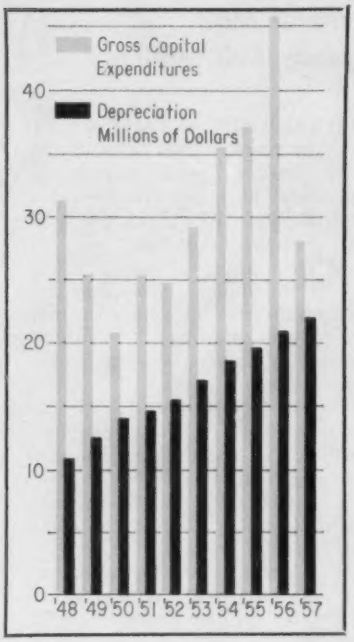
Outlays in '57 were for buildings and improvements at 8 meat plants and extensive modernization at 19 dairy and poultry plants. Equipment comprised new-type defeathering machines in large poultry plants, automatic packaging equipment in butter plants, and improved units in cheese and ice cream plants. Several oil mills have been enlarged and equipped to make new products.

Among steps taken to improve earnings were:

1. Streamlining plant operating methods through automation, new equipment development, and process improvements.
2. Increasing research emphasis on product development.
3. Improved scheduling of production and inventory.
4. Close control of maintenance costs.
5. Review and consolidation of facilities — 23 food processing and sales units closed in '57.
6. Better communications and control.
7. Realignment and strengthening of sales and marketing activities.
8. Closer correlation of advertising, merchandising, and sales efforts.

Changes put into effect have resulted in sizable savings in office procedures, maintenance, payroll, and related costs. Due to payments for employee separation, and other expenses incurred in closing and disposing of plants, full benefits from these changes are not apparent in the 1957 earnings.

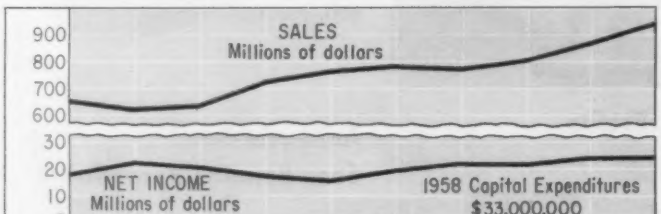
However, earnings in dairy and poultry operations have improved,



ice cream sales increased, and the soybean milling and technical products division showed advances.

Sales increased from $2,361 millions to $2,542 millions over the 10-yr. period 1948-'57.

During this time plant facilities were maintained in good condition, financed principally through provision for depreciation.



Borden Gears For Greater Sales

TO HANDLE an anticipated increase in sales volume and further develop the high degree of efficiency dictated by keen competition, The Borden Co. has set out to spend about $150 million in the 1957-'61 period on expansion and modernization of plants and equipment.

During '57 it disbursed $27 million on property and equipment—124% of net earnings—and plans to spend a big $33 million this year.

Major projects completed in '57 were: (1) a new food laboratory and pilot plant; (2) three fluid milk and ice cream plants; and (3) extensive modernization and expansion at three other plants.

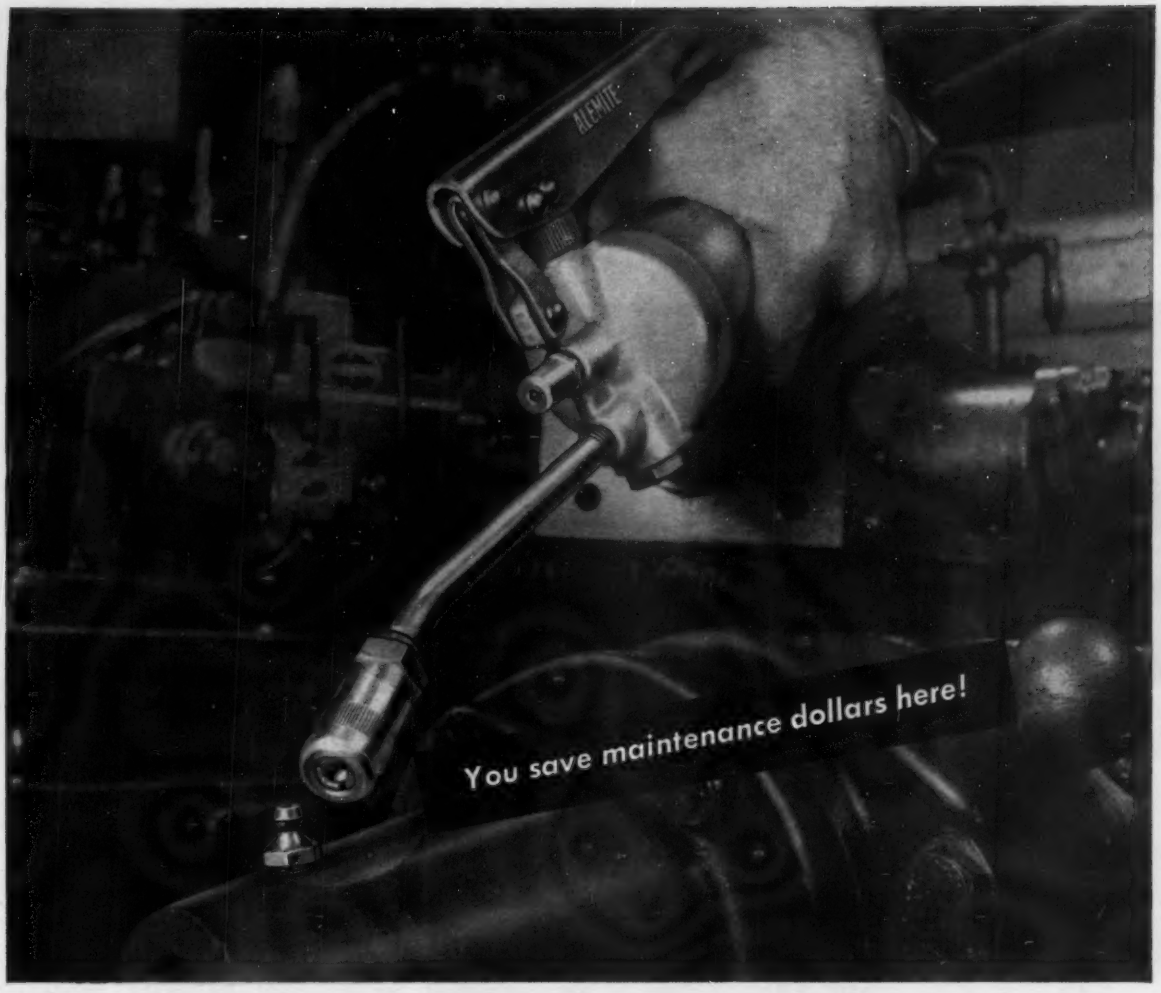
Scheduled for '58 are five new dairy plants and modernization and expansion of three additional ones.

In its rapidly growing chemical division, Borden completed a new laboratory and office building and two new plants, and it expanded two other facilities.

The company's growing product line saw introduction of a new instant coffee, an infant food, and three new animal feeds. Improved packaging techniques were applied to biscuits, cheese spreads, and natural cheese slices to provide greater convenience and better keeping qualities.

In the 10-yr. period 1948-'57, sales jumped from $649½ million to $931¼ million—43%. Company's earnings rose from $19 million to $24 million.

Of the '57 expenditures, $18 million was accounted as depreciation accruals ($14 million) and working capital ($4 million). Facilities valued at approximately $9 million—mostly motor vehicles and refrigerated cabinets—were obtained by lease.



Alemite Hand Guns and Fittings Give You Up to 10,000 lbs. of Lubrication Power!

The point of lubrication is where maintenance costs can be cut—providing you have the right equipment for the job!

This heavy-duty Alemite hand gun—combined with genuine Alemite lubrication fittings—brings up to 10,000 lbs. of pressure to even ordinary lubrication points. It gives you power to spare for fast, efficient, money-saving protection of every machine in your plant!

Gun handles all regular pressure gun greases. Long operating handle for maximum leverage. Loader fitting permits fast, clean filling (or gun may be filled by suction). Heavy steel linkage for true piston alignment. Capacity, 1 lb. Get more out of man-hours and machine-hours with Alemite lubrication equipment!

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PLAN '59 GROWTH/PROFITS

Here Are Latest Machines

Scores of significant advances highlighted for quick consideration.

PNEUMATICALLY UNLOADED bulk carrier discharges dust-free sugar (1,000 lb. per min.) directly into user's storage bin. (500)

MATERIALS HANDLING

LATEST handling methods and equipment cut costs in virtually every phase of food production.

Pneumatic, self-unloading trailers enable direct bulk delivery of flour and sugar. They deliver bulk sugar at 1,000 lb. per min.—practically dust-free and at savings of up to 25¢ per cwt.

Furthermore, when such shipments are tied into automatic in-plant conveying and proportioning setups, products go to point of use without any manual handling. (501)

Automatic screw-conveyor systems that unload rail cars and bulk trailers are also finding wide application. One design handles bulk sugar at 35 tons per hr.—saving 30¢ per cwt. (502)

And for efficient bulk-handling of smaller quantities:

Large metal bins (for solids and liquids), serving as shipping containers, storage units, and discharge hoppers, eliminate cost of disposable containers. (503)

Wirebound pallet boxes cut produce-handling costs—by curbing filling and unloading delays, minimizing product damage, and boosting storage efficiency. (504)

Roll-up rubber tubes (3,800-gal. capacity) haul liquids by truck, rail, or barge. For return trip, carrier is loaded with dry cargo. (505)

Keeping pace with strides in bulk-delivery are advanced methods for speeding them to process.

A "fluidizing" system that air-conveys dry powders and fine granules at high solids-to-air ratios eliminates need for dust collectors and cuts power costs.

Units handle flour at 400 lb. per min. (3-in. tube), cocoa powder and milk solids at 200 lb. per min. (2-in. line). (506)

Mass-flow conveyor-elevators provide efficient horizontal and vertical movement of pulverized and granular materials, also small lumps and flakes.

One fully enclosed system employs linked skeleton-type flights that move in a dust-tight casing. Product advances in a compact column and can be discharged at multiple points. Or unit can be arranged to recirculate material for packaging or distribution operations. (507)

Modern vibrating conveyors gently handle potato chips, noodles, dehydrates, and produce. Moreover, they offer operating and maintenance savings, flexibility for numerous unit operations, and sanitary design.

In a soup-mix operation, a 105-ft. overhead conveyor keeps 15 high-speed fillers supplied with noodles. And a 250-ft. unit speeds potato chips from cookers to a battery of gravity-fed packaging stations. (508)

Other advanced handlers . . .

. . . **Mechanical or hydraulic dumpers** that lift drums, boxes, and special-shape containers for easy and rapid discharge. (509)

. . . **Air compressors,** delivering oil-free air, for efficient bulk-handling of milk and ice cream mix. (510)

. . . **Conveyor belting** treated to resist deterioration by fats, oils, and chemicals. Readily cleaned with steam or hot water. (511)

. . . **Teflon tape,** easily cemented to metal, glass, wood, or plastic. It provides sanitary, non-adhesive surfaces with zero water absorption, chemical inertness, and broad service-temperature range. (512)

Mechanical handling of packaged goods has been a key factor in cutting distribution costs.

Lift trucks are continually being redesigned for greater maneuverability, versatility, and operator safety. Attachments permit palletless handling of unit loads and drums, also side-shifting to minimize repositioning of truck. (513)

Automatic palletizers, while not applicable to every packaging operation, are economically justified when production exceeds 15 cases per min. Standard models load about 40 cases per min. of a given size and shape, somewhat less with multiple sizes. (514)

Palletless unit loaders automatically assemble cases at about 35 per min.

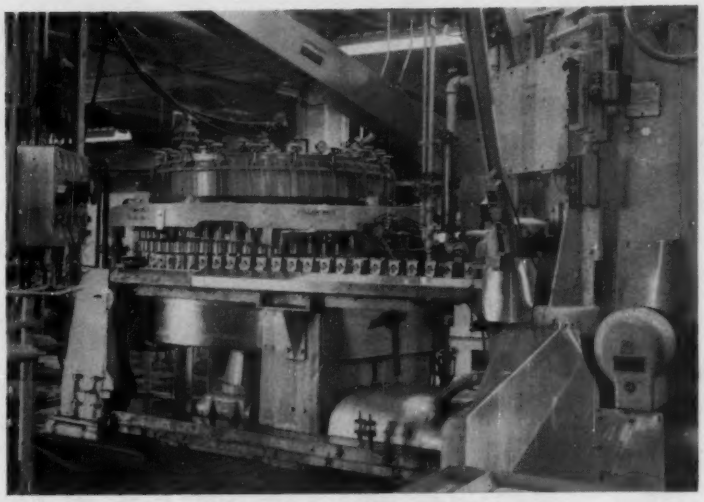
One machine has clamp arms that successively raise and hold tiers of cases, as they are formed, until pattern is complete. Load is then lowered to a roller conveyor for pickup by clamp-type lift trucks. (515)

Unitized handling is an important part of today's fast-growing trend toward automated warehousing and shipping. In fact, complete warehouse automation is now considered possible.

For Updating Your Plant

FE rounds up newest types of equipment for improving 16 basic unit operations

PACKAGING



760-PER-MIN. beer-can filler (12 oz.) eliminates loss of prime, prevents air pickup, and maintains uniform CO_2 content. (516)

AUTOMATIC PACKAGING, alert manufacturers are learning, is an effective way to cut spiraling production-line costs.

With in-plant labor no longer cheap, and compensatory retail price hikes curbed by stepped-up competition, the need to modernize operations—with new overwrap machines that take advantage of low-cost flexibles, higher-speed fillers that shave unit costs, and speedy case packers that mesh the packaging line with streamlined materials handling systems—is more pressing than ever before.

Now that polyethylene has displaced cellophane as the bargain favorite, new machines that exploit the film's versatility, and curb its trickiness, bring you big operating dividends. Available today are at least five poly overwrappers with capacities of 27-80 units/min.—plus two special attachments for standard end-feed bread wrappers that handle 60 loaves/min.

The fastest unit (80/min.) has Teflon-impregnated transport belts that carry the package past heating and cooling plates, thus protecting the film's surface and securing positioning of the folds. Another machine (75/min.), incorporating a redesigned sealing-cooling system, includes a completely new type of film feed and folding setup.

A heated Teflon belt that insures uniform sealing keynotes a third wrapper (60/min.), which also includes glass-fiber balls for slippage of cut film and static eliminator for accurate feeding. A fourth machine (40-60/min.) tubes the film in an upside-down former, hot-wire heat-seals it—then rotary-cuts it to desired length. Convertibility to other plastic films marks the fifth wrapper (27-45/min.), whose heating elements can be interchanged in minutes. (517)

Faster and more efficient forming and filling machines that boost output are slashing unit costs for progressive food firms. Typical are these:

A straight-line filler for cartoned foods that handles retail sizes at 240 cpm., institutional at 110 cpm. Money-eating waste is eliminated by "no carton-no fill" device as well as accurate premeasured fill. (518)

For canned products, there's a 36-station piston-type filler that whisks through 1,000 containers/min. Fill is accurately controlled by self-cleaning plunger-type valves. (519)

Then there's a high-speed packager that takes baked cookies from the oven and readies them for overwrapping at a 1,400/min. clip. First, it forms the cookies into sandwiches and divides them into four rows. Then, it stacks, groups, and automatically loads the product into cellophane bags, trays, or cartons. (520)

For a striking example of where modern equipment is helping food makers do a better job, look at pouch formers—a field where progress had lagged. One new unit, in a continuous operation, meters the product, then forms, fills, and heat-seals single-service packets. Wide temperature range makes it suitable for a variety of heat-sealable materials. (521)

Another recent machine forms bags from either cellophane or polyethylene roll stock (45/min.), then fills and heat-seals. (522)

And a third bag maker saves on film by limiting end closure to a $\frac{1}{8}$-in.-wide strip. (523)

More efficient integration of packaging with production and materials-handling operations is another dividend—brought you by modern equipment that, first, readies containers for filling and, later, case packs finished units. All this at faster speeds and with less manual labor.

For example, a new automatic can unsorter in a West Coast brewery replaces two men, handles up to 500 units/min. Empty 12- and 16-oz. tins are single-file delivered to fillers with open ends upright. (524)

A new case feeder-former-posi-

For more information on equipment, circle key numbers on Reader Service Card, back of book.

tioner-loader is fully automatic except for hand-loading of corrugated flats into the magazine. With a capacity of 720 cans/min., the unit reportedly saves 28% on paperboard. (525)

Fiber savings of 15% are cited for a second end-opening caser that can-loads at better than 20 boxes/min. Although designed primarily for single-tiered 46-oz. and No. 10 cans, it will accommodate smaller sizes. (526)

Keeping pace with improved packaging equipment are the modern check-weighing units that streamline operations and eliminate waste through radical use of the "feedback" principle, simpler handling, and faster operating speeds.

Brand new is a 200/min. unit that is monitored to the filler. When weight-variation trends develop, the checkweigher automatically makes compensating adjustments at the filling station. (527)

Less waste through more easily read results is achieved by another checkweigher whose photocells flash light signals for over- and under-weights. Control system can be used to actuate transfer mechanisms as well as chart-record for statistical and quality control purposes. (528)

And another new continuous-motion weigher checks at a 400 units/min. clip. It can handle all container shapes and sizes up to 10x10 in. (529)

Just out is an electronic unit that checks container fill height at a 1,000/min. rate and automatically rejects improperly filled cans. It can be mounted either before or after capping point. (530)

AUTOMATIC CONTROL

A PRIME FACTOR in boosting food-plant productivity has been the dramatic switch from manual supervision to automatic control.

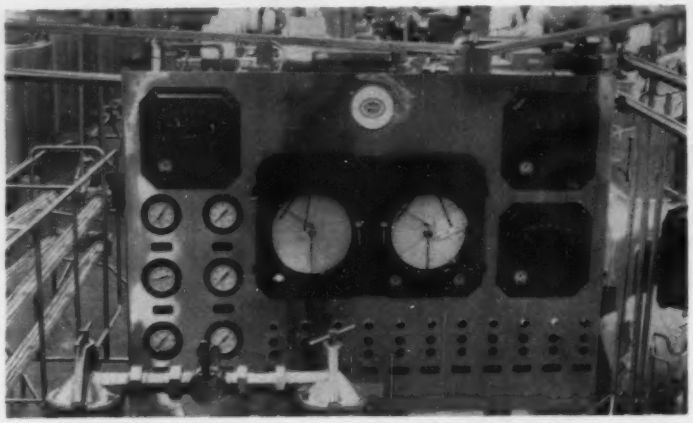
Electro-mechanical monitors will operate through relays to actuate electrical, pneumatic, or hydraulic servomechanisms to perform man-saving operations, such as freezer loading. And recently developed static control units (no moving parts) accomplish many functions formerly requiring high-speed relays with many multiple contacts.

X-ray level detectors assure proper container fill, while photocells are extensively used as "no container–no fill" devices, and to monitor case flow on conveyors.

Through in-stream analysis, process instrumentation is rapidly achieving direct quality control of products —right on the production line, where it operates most efficiently and economically. Control of process variables, such as temperature, pH, pressure, and flow is now virtually standard practice in efficiently operated food plants.

Continuous automatic control of product-quality factors is being achieved by triple-acting instrument systems that (1) detect deviations from pre-set quality standards, (2) apply instantaneous corrections, and (3) record the results.

Density of citrus concentrate is being controlled to 0.05 deg. Brix by an in-line refractometry system that one processor estimates will save $50,000 a year. Combining optical and electronic operation, it analyzes the process stream 480 times per sec. in controlling and recording the blending of evaporator output and the required cut-back juice. (532)



PUSHBUTTON CONTROLS automate this 1,500-gph. ice cream line. (531)

Gamma-ray transmission is being used to control density of liquids, slurries, granules, and powders.

One unit consists of a radiation source welded to a pipe (3-8 in. dia.), a detector, and recorder. Accuracy ranges 0.001-0.003 specific-gravity units, depending upon material and process. (533)

Another radiation device, for use with small-diameter pipes, employs a source and detecting cell. Output signals can actuate valves, pumps, or heaters in a closed-loop control system. Precision is 2% of range, which may be as narrow as 0.05 specific-gravity unit, and instrument operates at up to 350F. (534)

Consistency of applesauce is continuously controlled by a unit employing a hydraulically balanced flow bridge. This sanitary system is also applicable to baby foods, tomato products, and corn in cream style. (535)

Batter viscosity is being monitored in-stream by a spinning-bob viscosimeter that regulates addition of dry and liquid ingredients to a blender. (536)

Moisture in free-flowing solids is controlled to 0.2% by an instrument operating on the capacitance-bridge principle. It continuously samples some 100-200 lb. per hr. of the main stream. (537)

Another conveyor-line unit electronically measures and records moisture in cereals and baked goods. Selectivity ranges 0-30%, and system is unaffected by wide variations in line frequency or voltage. (538)

Nuclear magnetic resonance of hydrogen atoms in water offers particular promise as an in-stream-control property. Hydrogen's absorption of radio-frequency energy, under controlled conditions, gives a 30-sec. moisture analysis.

Sample need not be hydrogen-free in the solid phase, since protons in molecules other than water can easily be distinguished. With corn starch and similar products, measure-

ment accuracy of 0.1% is obtained over a 4-16% range. A calibration curve is required for each different product. (539)

Infra-red spectroscopy, although not yet successfully adapted to in-stream control of food production, is a powerful tool for rapid identification and measurement of organic matter. Similarly, gas chromatography holds tremendous promise for control of food odor and flavor.

Direct control of product quality is offered by a new unit that performs actual chemical analysis on the production line. Typical determinations include sugars, protein, vitamins, salts, and metals.

Instrument employs modules that perform the various analytical operations needed to condition the sample for final measurements, which may be accomplished by various techniques—colorimetric, conductivity, etc. (540)

X-rays are now being used to regulate thickness of extruded materials, such as dough, to 1%. Rays do not contaminate the product or alter food values. (541)

Particle-size control is a unique application of a new in-stream instrument that charts size-frequency data for monitoring the operation of size-reduction equipment.

Instrument operation is based on difference in electrical conductivity between particles and a fluid-suspension medium. Particle size ranges of 20 to 1 are easily handled in a single aperture size. (542)

Level-control units, of various types, are available for monitoring height of both liquids and solids in tanks and hoppers. Operating principles include gamma-ray transmission, ultrasonics, beta-ray absorption, and electrical capacitance. (543)

Sanitary flowmeters gage and control flow of liquids and slurries volumetrically, also free-flowing materials on a mass basis.

Employed in latter application is a unit resembling a centrifugal pump. Force exerted in accelerating a product from practically zero velocity at impeller to unit's rim speed is a measure of mass flow, and is independent of product temperature or viscosity. (544)

Data-scanning and logging systems continuously report on such process variables as temperature, pressure, flow, level, density, viscosity, and pH. Such setups enable an operator, sitting at a control desk, to instantly visualize, evaluate, and act upon every process irregularity as it occurs. (545)

SANITATION

UP-FRONT PROCESSORS are slashing sanitation costs—and boosting performance—with latest equipment for wet and dry cleaning, insect control, and waste disposal.

Automatic in-place cleaning of pipelines, tanks, and road tankers is far more effective, economical, and reliable than manual operations.

In one dairy, a "pushbutton" CIP setup simultaneously cleanses any two lines or tanks. Heart of the system is a 6-compartment, temperature-regulated supply tank, and a control panel. A separate 3-compartment tank handles the tankers. All told, there are 590 ft. of 2-in. pipe and 19 tanks to be cleaned.

In operation, product and recirculation lines are connected, then automatic controls actuate sequential delivery of clear water, alkaline solution, and compressed air. Periodically, buffered acid solution is substituted for the alkali.

Employed in storage tanks are spherical spray heads that provide complete coverage and clean by chemical rather than by jet action. Tankers are easily and thoroughly cleansed by a rotary jet unit that sprays a 3-dimensional pattern. Powered by compressed air, it is lowered through a man-hole by electric hoist. (547)

Dust removal from floors and equipment is efficiently achieved with central and portable vacuum systems. And floor cleaning costs are being substantially reduced by power scrubbers.

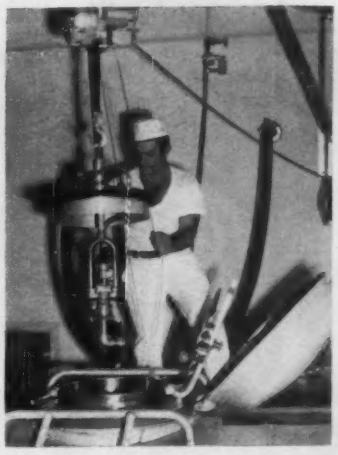
Portable wet-dry pickups now have increased suction power for faster, more efficient cleaning of plant and equipment. (548)

Scrubber-vacuum units (self-propelled) apply cleanser, scrub, flush (if required), and pick up in one operation. Machines with 26-in. brush spread clean some 9,000 sq. ft. per hr. (549)

Portable steam cleaners provide a steady flow of dry steam, with or without detergent, at the flick of a switch. They can also deliver hot or cold cleaning solution (up to 400 gph.) and high-velocity rinse. (550)

Automatic fogging permits easy, one-man control of insecticide-spraying of large areas. Moreover, it requires little maintenance and makes efficient use of insecticide.

Employed in one setup are special ceiling-rigged atomizers fed from a central insecticide supply. A single unit successfully handles up to 100,000 cu. ft. of space, and fogging takes only 10 min.



JET SPRAY'S dual-plane rotation gives complete tank-interior coverage for fast, efficient cleaning. (546)

Portable vaporizers enable fogging of small areas, such as laboratories and locker rooms. (551)

Spray guns are used to apply residual insecticides which, unlike the temporary atomizer mist, evaporate to leave surfaces coated with powerful agents active for a week. (552)

Faster refuse disposal at considerably less cost is being achieved with use of trucks specially equipped to lift, haul, and dump detachable containers.

A single carrier handles a number of containers (44 in one application). Spotted at convenient materials-accumulating points, they are picked up, sped to disposal site, and returned for reloading. There is no re-handling of material and one operator does the job. (553)

Recently introduced is a system offering completely hydraulic container handling and legal load limits up to 30,000 lb. Trucks employ a tilting frame, two container-raising and lowering cylinders, and a bail cylinder. All pickup and handling is performed without driver leaving cab, and units can transfer containers to and from docks. (554)

B.F.Goodrich

Easy-to-clean Koroseal belt prevents danger of mold build-up

Problem: When regular conveyor belts were used to handle pineapples in this canning plant, mold build-up was a terrific problem. It used to take a crew of 15 men two hours to scrape the belts and scrub them with cleaning compounds.

What was done: When a B.F.Goodrich distributor heard about the trouble, he recommended an improved food-handling belt, made of Koroseal flexible material, that stands fruit juices, most acids, cooking oils, and just about everything else that ruins other belts. A combination belt, made up of Koroseal and three different brands of rubber belting, was put to a test.

Savings: Since fruit juices can't soak into Koroseal's smooth, polished surface, the cannery found it much easier to clean, and mold build-up was prevented. Now only two men can flush off all the B.F.Goodrich belts in the plant in just one hour. The belts are in their fourth year of continuous service, have handled a wide variety of food products, and are still going strong.

Extra benefits: The B. F. Goodrich Koroseal belt resists cracking and peeling, never gets soft or sticky. There's no danger of contamination with Koroseal—it has no odor, no taste, never gets rancid.

Where to buy: Your B. F. Goodrich distributor has exact specifications on the Koroseal food-handling belt described here. And, as a factory-trained specialist in rubber products, he can answer your questions about the many other products developed by B.F. Goodrich for the food industry. *B. F. Goodrich Industrial Products Co., Dept. M-403, Akron 18, Ohio.*

Koroseal—T. M. Reg. U. S. Pat. Off.

B.F.Goodrich *industrial products*

PROPORTIONING

TODAY'S high-volume food processes, whether batch or continuous, rely on automatic proportioning to cut ingredient-handling costs and minimize the chances of human error.

An outstanding example is "push-button" formulating at a large East Coast bakery. Flour, sugar, shortening, syrups, and chocolate are all handled in bulk and delivered in any desired amount to any of 16 dough mixers.

Batching is controlled at a console having monitors and remote indicators for 18 different scales. Electrical interlocks provide fail-safe operation and enable panel attendant to follow the flow of each ingredient.

To formulate a batch, he merely selects proper mixer and presses "Start" buttons for each ingredient, per formula card. Then dry materials are conveyed from storage bins to mixer via sifters and weigh hoppers. Liquids are first pumped to weigh-off scales on way to mixer. (556)

Furthermore, these systems may now be actuated with punch-cards. This establishes full inventory control, with recording, accounting, and billing through efficient business machine methods. (557)

Automatic batching scales permit simple and accurate blending of materials.

In one application, syrups are weighed directly into a blend tank, which is mounted on a 30-ton-capacity scale. All operator does is set two hands on scale face, one for weight of first ingredient, the other for total batch weight.

Flow of first syrup is automatically shut off when scale indicator reaches first pointer. This actuates the tank agitator and pumping of second ingredient until final batch weight is reached. Agitator continues to run until product is thoroughly mixed. (558)

Sanitary flowmeters, of various designs, are solving the problem of controlling and recording flow of materials to and from processing. Accuracy ranges ½-2%, depending on operating principle.

Typical of units employed are: (1) Flow-rate meters, which multiply rate by time; (2) rotameters, which gage flow by movement of a plug in a tube; (3) sonic devices, which detect difference in velocity between sound waves traveling upstream and downstream; (4) electromagnetic units, which measure voltage produced by liquid flowing between electrodes; (5) turbine-type meters, which employ a multi-bladed rotor that is made to spin at a rate directly proportional to flow; and (6) positive-displacement units that convert movement of a fixed quantity of fluid into a definite number of shaft rotations.

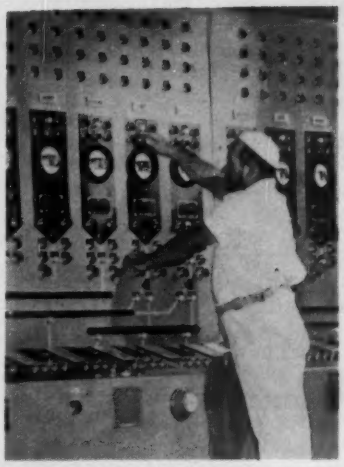
A disadvantage of any volumetric flowmeters is inaccuracy that results when air is incorporated into products handled. However, there are various methods of deaerating liquids before they reach the meter. (559)

Feeders, both volumetric and gravimetric, offer precise metering of solids from ounces to tons per min.

One unit, controlled by a 3-15 psi. air signal, affords high sensitivity and response in continuous blending or automatic batching of dry, free-flowing materials. Accuracy of 1% over a feed range of 3-3,000 lb. per min. is achieved by a pneumatic controller that instantly detects and corrects any deviation from a pre-set feed rate. (560)

Packaging by count of such items as cherries, nuts, olives, and candies has been automated by a photoelectric counter and feeder. In handling half-cherries for fruit cocktail, unit has saved 86% of former labor costs and eliminated overfills.

In operation, a photo head segregates from 1 to 12 conveyed pieces, then actuates batching of the group into cans. Unit delivers 800 cherries per min. when feeding in groups of 5 per can. (561)



AUTOMATIC BATCHING PANEL proportions ingredients into any of 16 dough mixers. (555)

HEAT APPLICATION

ADVANCED THERMAL ENGINEERING designed into the latest heat-transfer units offers extraordinary flexibility for economical processing and quality control.

Direct steam injection is employed in a new heat-exchanger for liquids, viscous foods, and those with discrete particles. Product fed to a plate rotating in an enclosed chamber is distributed as a thin film and heated while flowing down the chamber wall. After required holding in a tubular exchanger, it is flash-cooled in a vacuum chamber. (562)

A similar system serves as heater, cooler, or heater-cooler combination. When used as a heat-exchanger, product is metered to a steam-injection head at base of unit's holding tube. Instantly heated to processing temperature, it moves up the agitated tube, which curbs burn-on and retains product long enough to insure sterility. Flash-cooling can remove all moisture added by steam injection. (563)

Cylindrical heat-exchangers with advanced mutator-blade designs are widely used with pumpable foods. Precision agitation scrapes product from heating or cooling surfaces to boost heat-transfer rates. (564)

Efficient HTST processing, especially of milk, is offered by a recently developed Swiss unit. Treatment completely sterilizes dairy products, removes objectionable odors and flavors, and reduces acidity. (565)

Infra-red radiation is finding increasing application in drying, baking, and cooking. While power costs are a consideration, I-R processed foods cook faster, retain more moisture, and are under instant heat control. Saving of floor space and elimination of combustion products are other advantages. (566)

Sterile filling of fruit concentrates into pre-sterilized steel drums is now a commercial process. Aseptic can filling is progressing, and higher-capacity equipment is planned.

In drum filling, steam is applied

UNIT OPERATIONS

to both inside and outside surfaces in a retort-like processing chamber. Products (tomato, apricot, peach, pear) are delivered to system at 190F., and flash-cooled to 90F. Filling and drum closing take place in sterile atmosphere. (567)

MIXING

PRECISION MIXING, particularly on a continuous basis, plays a key role in modernizing production for greater output and quality control.

Continuous mixing is the basis of an advanced dough-making process. Ingredients are simultaneously metered to a pre-mixer, whose horizontal, spiral-blade agitators form the dough. Pre-mix chamber (16x16x39 in.) holds only about 74 lb. of material, which is processed in some 30 sec.

Ingredient flow is controlled by load in mixer, which is mounted on a knife-edge balance. When excessively loaded, unit tilts to operate a limit switch that cuts the speed of ingredient pumps and flour feeder. As load is reduced, mixer tilts to actuate switches that restore initial feed rates. (569)

Two-step continuous mixing is employed in production of cake batters and mayonnaise.

Solids and liquids are first metered into a pre-blender, which consists of a symmetrical bowl with twin-disk impeller. Pre-mix then goes to a post-blender having a toothed disk rotating between toothed stators, and a compressed-gas inlet. In the case of mayonnaise, final mixing (with addition of residual vinegar) is done in a nitrogen atmosphere.

With provision for starch cooking and cooling, this equipment will also produce salad dressings. (570)

Latest colloid mills, which mix, mill, and homogenize in a single pass, provide uniform size reduction and stable emulsions. Units are widely used in processing of mayonnaise, salad dressings, baby foods, meat and fish pastes, creamed cottage cheese, and chocolate. (571)

Uniform blending of dry or semi-dry mixes in high-volume continuous production is being achieved by a high-speed, paddle-type unit that breaks up and disperses agglomerates. Typical foods handled are bakery premixes, chocolate, and powdered milk. Capacities range 3,000-10,000 lb. per hr., depending on bulk density of mix. (572)

Ribbon-type mixers with special sanitary features enable efficient batch blending of a variety of products. (573)

Ultrasonics offers rapid mixing, emulsifying, and homogenizing of many products.

Peanut butter is now being ultrasonically homogenized in Canada, and reportedly its creaminess, smoothness, and stability are greatly improved. Other items successfully handled include mayonnaise, salad dressings, margarine, soups, sauces, and ice cream. (574)

High-capacity blenders now speed uniform mixing of dry ingredients and dispersion of any liquid, regardless of viscosity.

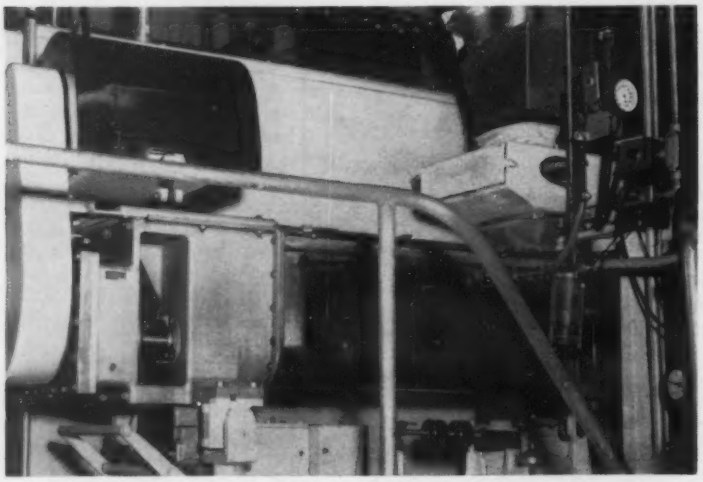
Rotating twin-shell units (capacities to 50 cu. ft.) have recently been modified for liquid feed, enabling efficient blending of melted shortening into dry mixes, also flavoring emulsions or spices into granular bases. Average operating time is 10-15 min. (575)

A new conical mixer cuts power requirements by employing the precessional motion of a rotating screw for rapid blending of dry materials, and wetting or dissolving of solids. Ingredients enter at top of unit, and screw reverses to discharge the blend through bottom. (576)

Blending and drying may be combined in a single operation to cut processing time and eliminate intermediate material handling. Employed is a heated, rotating double-cone unit (with glassed inner surface) that tumbles product under vacuum. (577)

Efficient 4-way action marks another high-capacity rotary dry blender, achieving high mix uniformity. (578)

In fluid mixing, propeller or turbine-type units do an efficient job with most liquids when impeller size, speed, and mounting are properly specified. (579)



CONTINUOUS PRE-MIXER blends bread-dough ingredients in 30 sec., also controls their feed rates by ingenious limit-switch action. (568)

WEIGHING

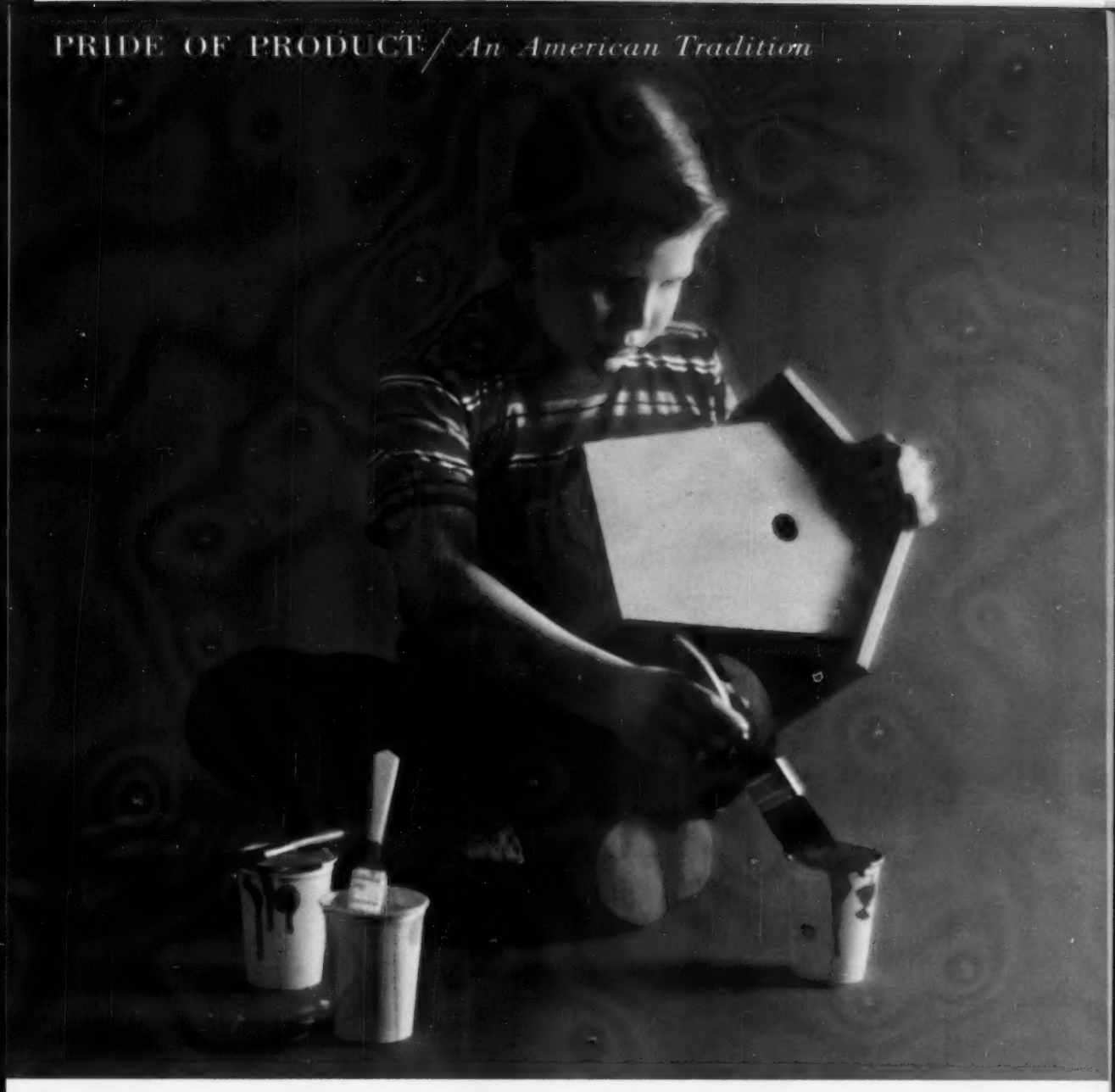
LARGE DOLLAR LOSSES, which can result from even the smallest weighing errors in today's high-speed food processes, are virtually eliminated by modern weighing devices.

Dial scales have been improved for greater ease and accuracy of weighing. Direct reading dials enable operator to use drop weights and still read total net weight on indicator. Full-swivel heads permit reading from any direction, and oscillation dampers absorb impact loads so that indicator moves to exact weight at controlled speed.

Units are available with total-chart capacities ranging from 500 lb. in ½-lb. graduations to 120,000

For more data, circle 281 on Reader Service Card→

PRIDE OF PRODUCT / *An American Tradition*



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WHEN "SOUP'S ON"—MAKE IT YOURS

The whole family's enjoying soup today—soup with its wholesome goodness enhanced by Huron* MSG (99+% Monosodium Glutamate). Their soup can be your soup if you include MSG in your recipes. MSG brings out the natural flavors of any soup but imparts no characteristic flavor of its own; that's why most food manufacturers include this flavor enhancer in their recipes. To guard and enhance the flavor of your canned, frozen, or dehydrated soup, try Huron MSG from Hercules. Added during processing, MSG locks in the natural flavors, helps prevent flavor losses during cooking, and helps suppress off-flavors that may develop during storage.

Looking for a subtle, different flavor that will add "something extra" to beef, chicken, or vegetable soup? Try Huron HVP (hydrolyzed vegetable proteins), the delicate background flavor similar to that of well-browned beef. Both of these fine Hercules products can add extra appeal to your soup products. For complete technical information on both MSG and HVP, contact our nearest district office or write direct to:

HURON* **MSG-HVP®** **HURON MILLING DIVISION** VH58-8

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Virginia Cellulose Department ***HERCULES POWDER COMPANY*** INCORPORATED *Wilmington 99, Delaware*

District Offices: 380 Madison Avenue, New York 17, N. Y.; McCormick Building, 332 S. Michigan Avenue, Chicago 4, Ill.; 120 Montgomery Street, San Francisco 4, Calif.

MANUFACTURERS OF AGE-IT®, WHEAT GLUTEN AND WHEAT STARCH

lb. in 20-lb. measurements. (580)

Checkweighing of packaged goods curbs costly product "giveaway" and, at the same time, assures adequate net weight (see p. 68).

Data-recording and transmitting features of advanced weighing systems range from simple print-out to elaborate process control.

One system, employing electronic data-handling, combines weight recording, tabulation, and remote digital indication. Another unit with adjustable photocells provides an electrical signal when pre-set weight limits are reached. A controller used with the scale can then operate relays, automatic transfer mechanisms, or recorders. (581)

Modern batching scales enable precise formulation under pushbutton control. (582)

A typical unit offers: (1) Accurate repeat weighing, (2) automatic listing and totaling of weights, and (3) remote location of totalizer and operating controls. Capacity is 40,000 lb. per hr., with drafts of 1,000 lb. (583)

Belt-conveyor scales integrate load weight and belt speed to express accumulated tonnage on remote indicators. (584)

Electrical weighing systems of load cells and indicator-controllers speed batched formulations. Employed is a strain gage whose change in dimension and, therefore, electrical resistance is proportional to applied load.

In a liquid-sugar operation, ingredients are successively batched into a tank mounted on a triangular frame of I-beams, corners of which rest on three load cells. Unit gives direct readings to 30,000 lb., and is accurate to 0.1%. (585)

An electronic platform scale with null-balance circuit offers accurate weighings of concentrated loads up to 40,000 lb. It is specially designed for severe service, and up to four platforms can be read from one indicator. (586)

SEPARATION

MODERN SEPARATION EQUIPMENT is geared to high-speed continuous production, which cuts costs and ups performance.

Decanter-type centrifuges (horizontal and vertical) remove solids from slurries and clarify liquids. Speeds range 2,000-4,000 rpm., capacities to 250 gpm. (588)

Improved nozzle-type units, operating at 50 psi. or more, provide efficient clarifying, separation, or solids concentration at up to 300 gpm. They employ a double-row nozzle system and 30-in. dia. bowl. (589)

Continuous separation of juice and seed sacs from passion-fruit rind without extracting rind juice is accomplished by a specially designed centrifuge. Its use for other tough jobs is foreseen.

Cyclones are finding use in wet corn milling for separating gluten from starch. Employed to polish liquor from Merco centrifuges, they reduce protein content of starch liquor to about 0.25%. (590)

Batch-type basket centrifuges are now available with control panels for semi- or fully-automatic operation. (591)

Highly efficient classification of flour, sugar, salt, starches, and cocoa, in the 10-125 micron range is effected by new classifiers. One unit is available in four capacity ranges (1,000-30,000 lb./hr.), and cutpoint is sharp regardless of feed rate or size distribution. (592)

Filters have been redesigned to boost capacity and cut labor requirements. Vertical-plate units have been made self-cleaning by incorporation of water sprays and/or air pressure vibrators.

Substitution of this equipment for plate-and-frame filters in a West Coast sugar mill enabled flow rates to be increased from 2½ to 12½ gal./sq. ft./hr., and labor cut from 3 to 1 operator. Filtration costs for the 1957 season amounted to 1.4¢/ton of beets compared with 3.2¢ in '56. (593)

Improved dust filters increase recovery of "fines". One type employing the cyclone principle also felt-filters the air. Filter sleeves are cleaned intermittently by high-velocity counterflow action. Capacities: 285-16,000 cfm.

Another unit comprises a rectangular housing with tapered bottom containing cylindrical filter elements. Dust-laden air drops major portion of solids upon entering side of housing. Remainder is deposited on outside surfaces of filter elements.

Surfaces are cleaned by high-pressure air jets controlled by adjustable electric timer. Capacities range 400-5,000 cfm. Efficiency reportedly exceeds 99.9%. (594)

Sorting units are available for separation of peas, beans, nuts and other small foods, according to color, and at high speeds.

TURBO SEPARATOR provides high air dilution, permitting ground particles to follow inertial forces for highly efficient classification. (587)

In one West Coast plant, more than a million lemons are sorted daily into 5 color grades by a 6-machine installation. Setup not only released 40 graders, but sorts more accurately than formerly possible.

Another unit separates lemons into 4 color grades at 40/sec., then automatically fills them into boxes.

An egg sorting unit detects blood spots or bloody albumen, and automatically rejects eggs containing them. Product is automatically sorted into 4 grades according to size. Machine "candles" 7,200 eggs/hr. with an accuracy of about 98% compared with 55% by hand candling. (595)

Degassing of liquids may be performed by either vacuum or ultrasonics. One unit of the latter type is employed in a large Eastern brewery for removal of air from bottled beer between filler and crowner. (596)

Vacuum degassers, largely used for removal of off-flavors and odors from dairy products, are of two general types. Simplest ones comprise vacuum chambers into which product is introduced at elevated temperature during HTST processing. For more complete removal, steam injection, followed by vacuum-cooling, is employed. (597)

Vibrating screens are now avail-

PLAN '59
GROWTH/PROFITS

UNIT OPERATIONS

able for efficient sizing and separation of most foods.

In continuous screening of slurries, such as corn starch, a recently introduced stationary unit handles 200-500 gal./min. per ft. of screen width, on 8-48 mesh separation.

Screen is concave, horizontal-wedge-bar type secured in stationary housing. Integral with it is a feed box that distributes slurry across full width. Undersize material is collected in lower part of housing, oversize product flows across lip at base.

Another sifter, powered by sonic energy, is said to have 5 times the capacity of similar sized mechanical units, and separates down to 30 microns. In operation, low-range sonic energy is transmitted directly to the screen, creating violent vibrations with little flexing. (598)

Separation of meat from bones in poultry packing is now possible with a new machine said to have a capacity of 10,000 lb. chicken (cooked) per 8-hr. Unit recovers 38-40% of meat from carcass, and reduces hand labor 60%. Flotation removes bone particles from loose meat. (599)

Cold extraction of fats and oils from cellular tissues such as bones is now performed by ultrasonics. Material is suspended in cold water that is subjected to high-frequency vibrations. Cells are instantly ruptured, allowing fat to rise to surface of water, from which it is separated by centrifuging. Recovered fat is a white, pure, bland solid. (600)

MOISTURE REMOVAL

PRECISE automatic control has robotized moisture removal for higher efficiency and economy.

Instrument-controlled spray dryers produce dehydrates, such as flavorings, having uniform high quality and extended storage life. Dispersed as a mist, they are instantly dried in a filtered hot-air stream. Particles range 10-250 microns, each with a high ratio of sealed surface area to volume. (602)

GIANT SPRAY DRYER converts precooked starch paste into fine particles with 3-4% moisture. (601)

A new double-effect evaporator efficiently condenses skim milk tomato pulp, and fruit juices.

Employed is a unique system of baffles enabling each effect to operate as a triple-stage evaporator. Result is efficiency approximating that of a conventional quadruple-effect unit at an investment roughly equal to that for double-effect equipment. Evaporation is 3.1 lb. water per lb. of steam, and automatic controls eliminate need for experienced pan operator.

Other advantages: Automatic controls that eliminate need for experienced pan operator, easy CIP cleaning, minimum entrainment losses, and space saving. (603)

Multiple-effect evaporation in a new single-pass evaporator offers high-density tomato and fruit pastes, and has been proposed for milk.

Units, ranging from three to six effects, employ positive-displacement pumps with special orifice design. System uses 0.89 lb. steam per lb. of water evaporated. (604)

Partial dehydration, whether for subsequent dehydrofreezing or for conventional drying, is economically accomplished in a new belt-type unit that removes 650 lb. of water per hr.

In operation, product is dried as it passes over an endless wire-mesh belt that is supported and driven by two roller-chain sprockets. Belt forms a product-carrying trough, bottom of which moves across the top of an inclined forced-air grate. (605)

Essence-recovery units, in conjunction with vacuum evaporators, now enable successful concentration of a number of fruits and berries heretofore not processed by vaccum. (606)

Infra-red lamps reduce moisture content of exploded corn-meal snacks from 13% to 3%. Product is conveyed under lamps at 150 lb. per hr. (607)

SIZE REDUCTION

TWO PRIME KEYS to lower-cost production of quality foods are offered by modern size-reduction equipment.

1. Versatility of latest models enables simultaneous handling of one or more associated unit operations, such as forming, mixing, homogenizing, etc.

2. Extreme control of particle size and size distribution cuts costs by minimizing unwanted fines and tailings, reducing cooking time, and assuring uniform, sift-free blends of dry mixes.

In continuous production of cracker meal and related mixes, a comminuter forms dough by grinding dry ingredients in the presence of a metered water spray. Automated operation turns out 6,000 lb. of product per hr. and employs only two men. (608)

Selective separation of usable and non-usable portions of products can eliminate a finishing operation. For example, blanched asparagus may be so processed as to yield a puree from softer portions, while rejecting fibrous matter. (609)

A multi-purpose unit for meats, prepared mixes, and confectionary fillings continuously produces particles ranging from discrete chunks (fresh sausage) to emulsions (frankfurters). By remote control, it handles meats directly from the trimming table after preliminary grinding or blending. (610)

In a tandem setup, chicken sticks (and other stick products) are produced by comminuting necks, skins, wings, gizzards, etc., with broth. Resultant paste is ground with light and dark meats, mixed with cooked rice and seasoning, chilled, formed, breaded with comminuted corn flakes, frozen, and packaged. (611)

Controlled flaking of a grating cheese (instead of cubing) provides

your product belongs

in glass by Brockway

Is YOUR product in evidence when culinary "experts" don the chef's hat to prepare a feast that is fit for a King? The first requirement is consumer acceptance . . . acceptance of the fine taste and special goodness of your product . . . and acceptance for the container in which it is presented for sale. ● Nothing will make a good product more readily acceptable than a quality glass container by Brockway . . . a container that presents the product with all its appetite appeal . . . a container with unique clarity to provide sales appeal unmatched by any other type of container. ● A product that is worthy of consumer acceptance deserves a quality glass container by Brockway.

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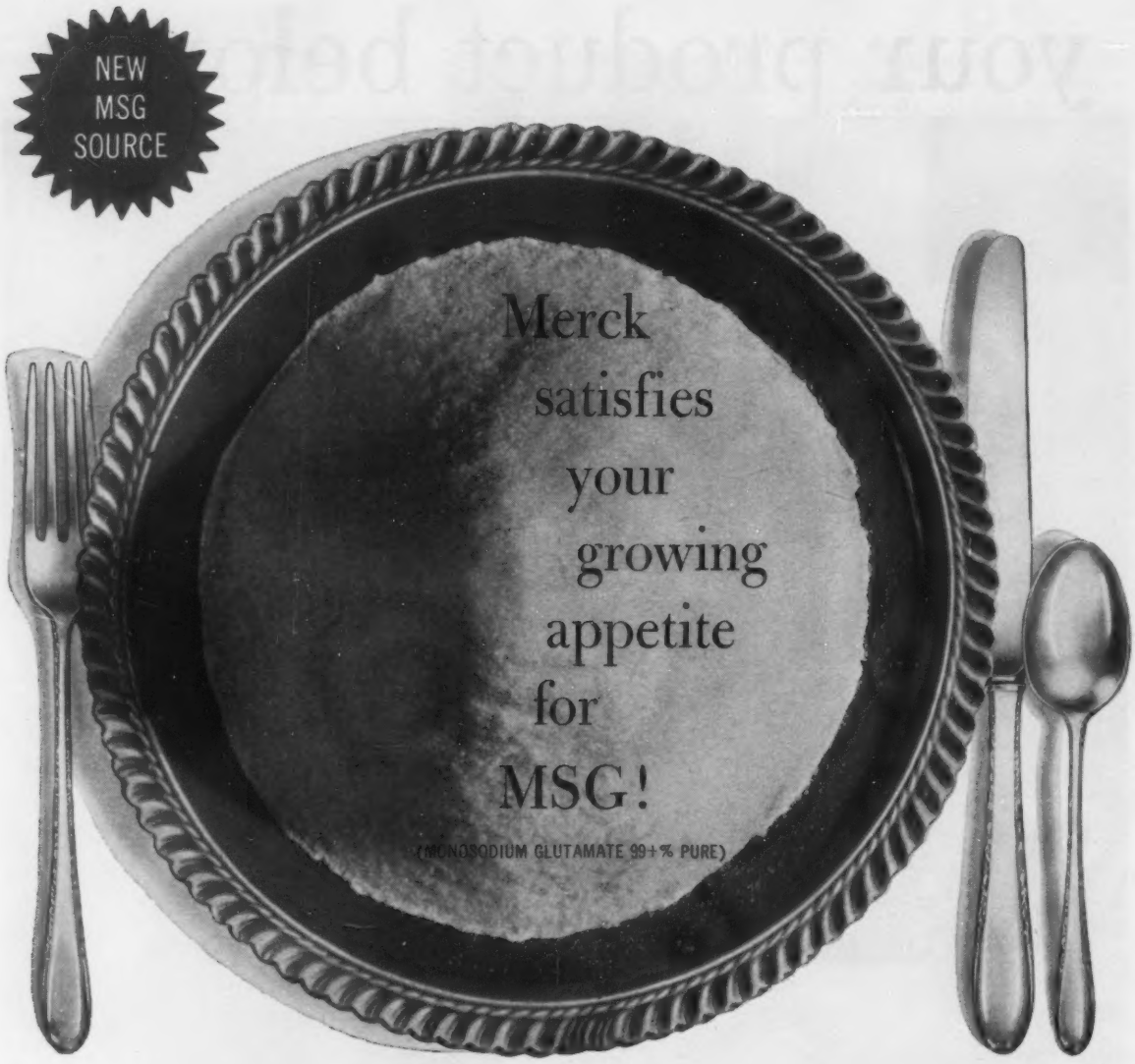

1. Merck is your new basic source of supply for MSG. Recently completed Merck production facilities with multimillion pound MSG capacity can satisfy even the healthiest appetite for this important flavor-enhancing ingredient.

2. You can depend on Merck for unlimited quantities of MSG because the unique and technically advanced fermentation process utilizes raw materials which are available in unlimited supply. No other Merck product or process competes for this supply.

3. Like all Merck food processing ingredients, the quality of Merck MSG is unsurpassed. It meets the highest quality-control standards for monosodium glutamate 99+% pure.

4. Merck MSG is available in two forms—Crystals and Fine Crystals—to fit your requirements. It is packaged in 100-lb., 50-lb., and 10-lb. containers.

5. Merck MSG deliveries are fast, since distribution centers are strategically located from coast to coast.

6. The Merck Food Research and Technical Laboratories are fully staffed and ready to serve you. Technical assistance, including MSG assay service, is available on request.

7. Ask your Merck representative for complete information about Merck MSG or write directly to:

MERCK & CO., INC.
RAHWAY, NEW JERSEY

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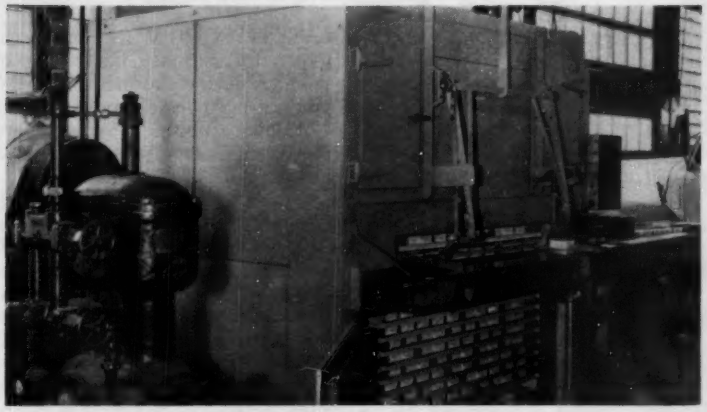
greater apparent volume and maintains appearance when used on sauces. (612)

Complete size reduction of whole products, such as peanuts and cacao nibs, is accomplished in multi-purpose units that shear, mix, emulsify, and homogenize. (613)

Combination air and mechanical classifying is the solution for materials that can't (for cost and/or product quality reasons) be completely reduced in one step. It's more economical to (1) grind coarser, (2) air classify to separate usable material, and (3) recycle oversize material in a closed system. (614)

Turbo-milling employs the air-vortex principle for ultra-fine grinding of grain and efficient air classification. By "tailoring" flours to specific needs, it opens the door to sharper control of size reduction for greater product uniformity. (615)



IN CONTINUOUS PLATE FREEZER, pressure on cartons assures good heat transfer and a flat package for easy cartoning and stacking. (616)

REFRIGERATION AND FREEZING

MODERN EQUIPMENT for cooling and freezing of foods offers many cost-cutting and quality-improving features.

Latest refrigeration compressors, such as multi-cylinder V/W types and rotary boosters, combine high efficiency with important savings in weight and size, particularly for low-temperature operation. (617)

Reciprocating compressors, also widely used, have improved valves, bearings, and lubricating systems that enable about 10% higher operating speed. (618)

Absorption-type refrigerating units, which eliminate use of compressors, operate economically with exhaust steam or any other low-cost heat source.

One series of "pushbutton" machines, used in air-conditioning and process-cooling systems, has no major moving parts and can be controlled by time clock or thermostat. It automatically adjusts to varying loads with little loss of efficiency, and is unaffected by overloading. Capacities: 100-700 tons. (619)

Package water chillers find wide application in product and process cooling, also in air conditioning. Compact, self-contained units have capacities ranging to 350 tons. (620)

Cold diffusers efficiently provide low temperatures for cooling, hardening, and quick freezing. Latest models eliminate the frost problem and much of the maintenance required with former coil systems. (621)

Radiant cooling, a relatively new procedure, involves radiation of heat from a product to a special surface. Employed for baked goods and confections, it: (1) Cuts product-cooling time, (2) reduces moisture loss, and (3) saves space. (622)

Continuous plate freezers are widely employed for packaged produce, meat, fish, and ice cream.

Units consist of a number of refrigerated plates (horizontal, vertical, or radial) and loaded by a ram or indexing conveyor.

Freezer plates are closed on packages during freezing, which boosts heat-transfer and flattens cartons for efficient stacking in shipping cases and display cabinets. Plate temperatures range to −50F., and contact time varies from 45 min. to 2½ hr., depending on package size and product. (623)

Air-blast units, less complex than the above plate-type freezers, are more versatile and highly efficient when properly engineered.

A continuous "shelf" unit employs sliding package carriers (shelves) that are pushed through the freezing zone by hydraulic rams. Cartons are aligned in carriers on specially grooved shelves so that three sides are exposed to the cold-air blast. In freezing ice cream, a large-capacity model holds 6,720 gallon cartons and freezes 1,400 gal. per hr. (624)

Overhead freezing conveyors, equipped with baskets or hooks, efficiently handle smaller volumes of frozen goods. One unit, widely used for freezing of ice cream, has recently been adapted for handling of poultry and eggs. (625)

Spiral-belt freezers, originally designed for baked goods, are now equipped to handle poultry, meats, fish, and ice cream. One unit, with centrally located coils and fans, has 900 ft. of straight-wire conveyor arranged in eight tiers and enclosed in an insulated box. It freezes 8,000 lb. of sliced and wrapped bread per hour. Total refrigeration load is 87.4 tons. (626)

Conveyorized tray units consist of solid or mesh trays pivoted to two chain conveyors that form multiple tiers. For hardening ice cream, the equipment processes 4,800 gal. in a 3½-hr. cycle. (627)

Belt tunnels are finding wide application in loose-freezing of produce. One such unit handles corn at 4,000 lb. per hr., and peas at 5,000 lb. per hr. (628)

Imersion freezers offer high heat-transfer rates because products (packaged or unpackaged) are processed directly in the refrigerant (alcohol, propylene glycol, etc.). Thus, canned goods (No. 202) are frozen at 300 min., and turkeys at 5,000/hr. (629)

Continuous liquid freezers are extensively used for freezing ice cream and slush-freezing concentrated or-

. . . proved in use for high efficiency, low cost DRY SEPARATIONS

From oats to popcorn, sesame seed to dehydrated garlic, corn to chemicals—you can treat dry granular products with low-cost efficiency to remove dirt, rodent pellets, weed seed or other objectionable material.

Electrostatic separation with the new Dings CORONATRON is the secret! Multiple separation zones in vertical arrangement deliver high capacities at 99% purity with no further treatment.

The CORONATRON, with economical low intensity design or with the exclusive patented sparkless electrode for safe high intensity operations, has been thoroughly job proved in food processing, milling, seed, grain and chemical industries. Its many profit-making features are well worth your investigation. Write today for literature.

Dings ES-258½

DINGS MAGNETIC SEPARATOR CO.
4741 W. Electric Ave., Milwaukee 46, Wis.

ange juice, also for chilling and plasticizing margarine. (630)

Batch-type units, such as pressure-plate freezers, tray-and-cart tunnels, and blast rooms, combine versatility with low initial and maintenance costs. They are particularly adaptable to low-volume production and handling of bulk products. (631)

AIR CONDITIONING

ATMOSPHERE CONTROL boosts food-plant productivity by providing optimum conditions for (1) storage of ingredients and supplies, (2) processing and packaging, and (3) employee comfort.

Chemical dehumidification employs the moisture-absorbing property of lithium chloride solution. Rate of absorption is regulated precisely by control of solution temperature with standard coolers.

Absorber units have air-washing and regeneration sections. In the latter, moisture is driven off into a scavenger air stream, and concentrated solution is pumped back to the washing section.

In comfort-air-conditioning of a large research laboratory, this equipment keeps seven zones at 80F. and 50% R.H., when outside conditions range as high as 95F. and 78F. wet bulb. (633)

Packaged refrigeration systems, using both chilled and hot water, offer simultaneous heating or cooling of zones, continuous cycle control, and savings in operation, maintenance.

A typical 150-ton unit, installed in a candy plant, recovers product heat to hold room temperature at 75-85F. and humidity below 50%. No reheat coils are used, which saves on heating and refrigeration costs. Key system components include fan-coil units, water chillers, and a blending cell.

Heat from candy is picked up by an air stream and transferred to fan-coil units, where proportioning with outside air gives desired conditioning. For cooling, outside air is circulated through water-chill coils of fan-coil units. Chilled water is supplied from a blending cell, which serves as a distribution point. (634)

Adsorption-type units, employing silica gel as the drying agent, provide humidities as low as 10% over a wide temperature range for areas up to 100,000 sq. ft.

These dual-tower assemblies are automatically regulated so that one tower operates while other is being regenerated. One model has a dry-air output of 150 cfm., and removes 4-5 lb. of water per hr. Regeneration of silica gel is accomplished automatically by electric heating elements. (635)

WASHING AND PEELING

LATEST EQUIPMENT and techniques for washing and peeling of produce boost raw-material yield, product quality, and appearance.

Anionic wetting agents have proved extremely effective in removing thrips from cane berries.

Used in dipping solutions, both sodium alkyl aryl sulfonate and sodium alkyl sulfate thoroughly wet berries (and other foods), thus enabling removal of up to 95% of insects (adults and larvae). Furthermore, such agents have no detrimental effect on quality. (637)

Freeze-grab — a novel peeling method—quickly removes skin, stems, and scales from foods, much like a magnet picks up iron.

Process involves freezing a moist object to a clean refrigerated surface, then removing it with a scraper. Surfaces may be refrigerated rollers, plates, screw-type rollers, etc. (638)

Cup-down peeling of peaches ups product yield as much as four cases per ton, also improves flavor and appearance.

Fruit is handled without subjecting cup side (pit cavity) to lye solution. Pre-heating the solution lowers the concentration needs for proper peeling and reduces peeling losses. (639)

Eight extra cases of pears per ton of fruit is the cost-cutting yield of a new peeler and corer. Rated capacity is 6 tons per 8 hr. of operation, with recovery of 75-80%. Core and peel constitute 15-18% of raw product. (640)

A new tomato peeler, using a 700F. air-blast to remove only a paper-thin skin layer, offers high capacity.

In operation, 10,000 cfm. of air is blown through upper portion of a turning reel having rotating rollers. Product moves only across top of reel. It is rotated during the brief air-blast, then drops onto a mechanical peeler that engages loosened peel and "rolls" the tomato out of its skin. (641)

TRIPLE-ACTION UNIT peels, cores, and stems six pears at once. Handling 66 per min., it ups yield 8 cases/ton. (636)

Enzymatic breakdown of skin-binding pectin in an Italian tomato-peeling process reportedly cuts labor requirements 70% and ups both yield and quality.

Product is briefly immersed in 5F. brine, which freezes the skin and outermost flesh laver in 30-40 sec. and forms ice crystals that rupture the cells. After thawing, tomatoes are submerged in 86F. water, where released enzymes dissolve pectin in 8-10 min. (642)

FORMING

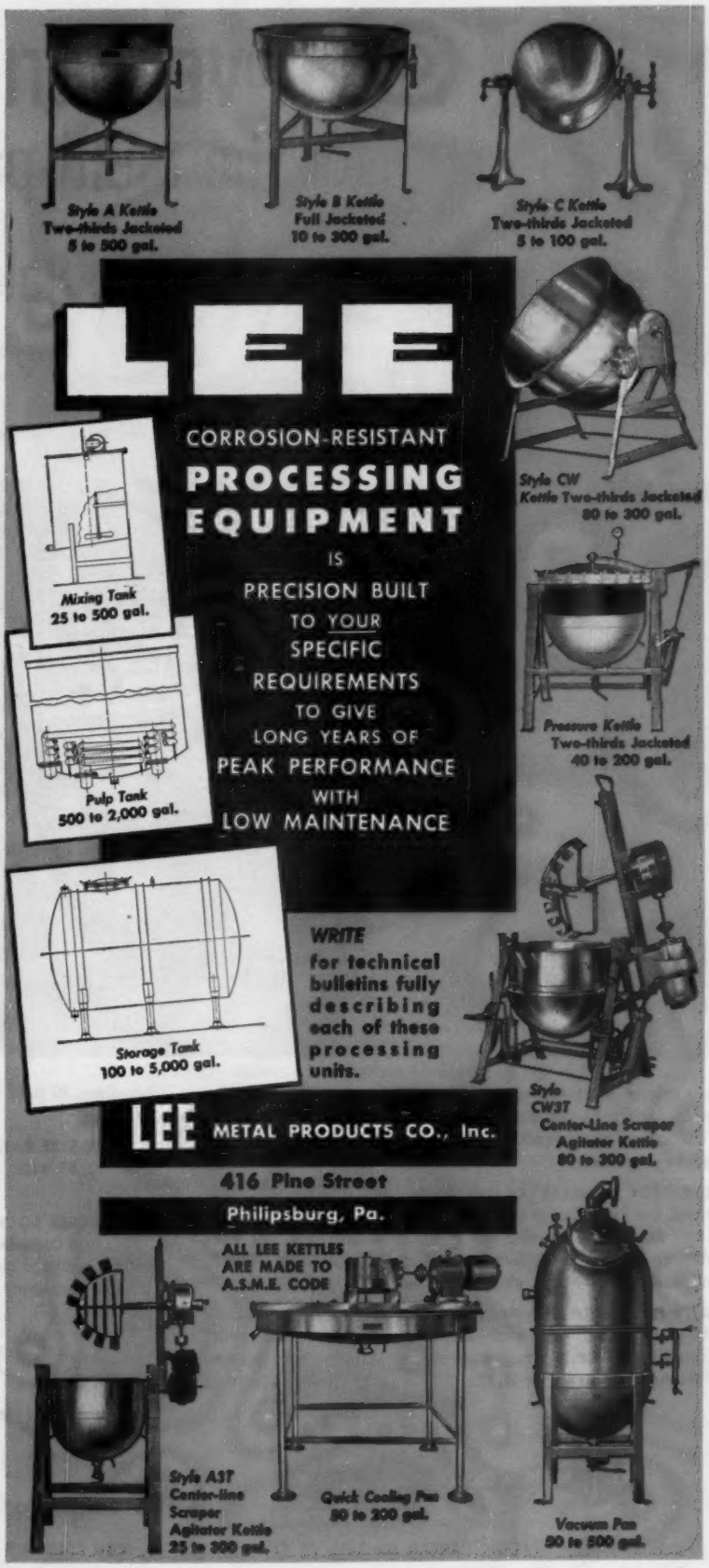
TO BOOST PRODUCTIVITY of forming operations, processors are switching to high-speed continuous equipment that forms food to precise shape and weight. Moreover, they are adopting multi-function units which, for example, form and package.

A precision rotary unit, forming each piece individually, permits continuous operation to fryer or freezer. It handles 2,500 lb. of material per hr., and vacuum forming curbs damage to delicate ingredients. (643)

Significant savings in handling, equipment, and storage space are being achieved by eliminating the costly and potentially hazardous starch-casting of mint creams. Instead, product is deposited on a continuous belt, cooled within 15 min., and enrobed. (644)

Similar cost savings are reaped when confections are hopper-fed through sheeting rolls onto belts traveling through a chilling tunnel. Sheet of multi-layer confection is then slit into continuous strips, which are automatically cut into bars for enrobing. (645)

Continuous extrusion of dough plays a key role in automatic produc-



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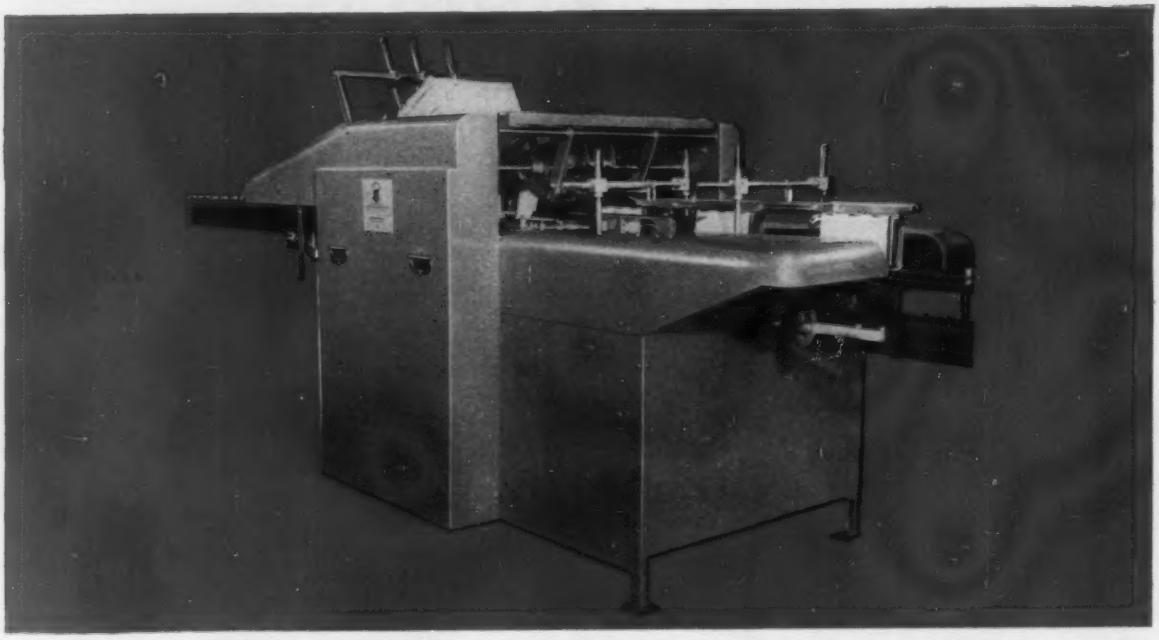
Now! MULTI-VERSATILITY for the multi-packaging field!

GAIR'S new Jak-Et-Pak "50"

- multi-paks cans *and* bottles!
- cuts change-over time from days *to minutes!*
- cuts down-time with trouble-free operating efficiency!
- and offers exclusive, new Duo-Lok for your customers' convenience!



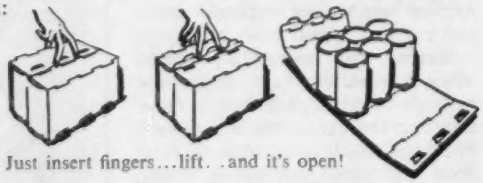
No matter what you pack—in bottles, jars, or any one of a wide variety of can shapes and sizes...the new Jak-Et-Pak "50" offers more practical versatility than any other multi-packaging system!

THE "50" HANDLES not only double and single-line formations, but can change over from double line to single in *less* than an hour!—and changes a 1 x 3 count to a 1 x 4 in minutes! Yet the only tools needed are an adjustable wrench, a small Allen wrench, and a "C" clamp.

AND FOR EXTRA-COMPACT CONVENIENCE the "50" is only 10'4" in length, 4'2" wide—including the in-feed conveyor! Simplified suction feed assures no skipping or double-feeding. And as to speed, the "50" is rated conservatively as handling 50 paks per minute—regardless of number of units per pak!

A WIDE SIZE RANGE for packages—from 1¾" to 12" high, 2⅛" to 8" wide, and 6" to 12" long—all on the wonderful "50"!

INGENIOUS LOCKING MECHANISM is built right into the "50", and contains *no moving parts!* Duo-Lok provides excellent package closure, and extra fast and easy opening for greater consumer convenience and merchandising appeal... like this:



Just insert fingers...lift. .and it's open!

GAIR creative engineering in packaging

BOXBOARD & FOLDING CARTON DIVISION OF CONTINENTAL CAN COMPANY • 530 FIFTH AVENUE, NEW YORK 36, N.Y.

tion of white bread—70 loaves (1 lb.) per min. Highly sanitary system saves 31¢ per cwt. of product and requires only two operators. (646)

And here are 5 other innovations:

1. Production of 400 link-type skinless sausages per min. with an air-operated machine. Unit can also be used to shape meat or other emulsions into other forms. (647)

2. Forming various foods for chub-shaped packages. Machine forms and seals roll-fed plastic film into a tubular-shaped package, then product is filled and package ends are sealed with metal clips. (648)

3. Producing mold-type chocolates —tablets, solid bars, and filled candies —at 800 per min. Employed here is a special Italian machine. (649)

4. Equipment for cutting fruits, vegetables, meats, etc., into various forms—strip, slice, dice, quarter, crinkle-cut, or French-fry. (650)

5. Twisting and joining of dough pieces in automatic molder-twister-panner. Unit handles up to 90 pieces per min., and is readily adapted to producing 3- or 4-twist loaves up to 2 lb. (651)

COATING

ADVANCED MACHINES and methods for coating foods point the way to lower-cost production of quality goods.

Dry or press coating of tablets, a relatively new technique, offers promise as a substitute for pan coating.

Instead of multiple syrup applications and alternate drying, dry coating involves use of a two-stage tableting unit that forms a core of granular material, then coats under pressure. Method is not limited to a single core and coating, but can produce several combinations of each. Production ranges to 1,000 per min. of various-shaped tablets of up to 3 in. dia. (652)

Modified enrobers wax-coat cheese, pickles, and frozen meats in a conveyor-line operation. Wax is drained from product and recovered. (653)

Extrusion-coating permits ice-cream, for example, to be formed into a thick continuous ribbon. After low-temperature hardening, it is cut into bars for enrobing. (654)

In double-extrusion, product center (or filling) and coating are extruded through a die within a die. Continuous product "rope" is belt-conveyed (with or without cooling or drying) past mechanical cutter that sizes it for packaging. (655)

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite

End-of-season protection cuts next year's start-up costs

POST-SEASON CLEAN-UP and protective action shows up as a big economy the following season. For example:

Outdoor conveyor chain at one cannery carried containers from railroad cars to interior storage area. Each year the conveyor was torn down, stored, then reassembled at start of the new packing season . . . at a cost of $200. Now, Oakite STEEL PRESERVER is applied to the line in place at season's end. It keeps the conveyor rust-free through the Winter . . . strips off with Oakite detergents, leaving the conveyor ready for instant action at Spring start-up.

Inside plants too, Oakite materials protect equipment during seasonal shut-downs. Recommended procedure: thorough cleaning with specialized Oakite materials; then spraying with Oakite SPECIAL PROTECTIVE OIL, which provides between-season protection against indoor rust. Use STEEL PRESERVER where excessive moisture is expected. In either case, getting equipment back into production shape next season will take fewer man-hours—and cost less.

The big PLUS in Oakite

Working with the Oakite man is like adding a consulting cleaning engineer to your staff. He brings with him the results of latest sanitation research . . . information on modern cleaning methods . . . the vast experience of the Oakite organization . . . time—and money-saving equipment . . . materials *guaranteed* to do the job. Ask him for proof. Or, write for Bulletin F-9414. Oakite Products, Inc., 27A Rector Street, New York 6, N. Y.

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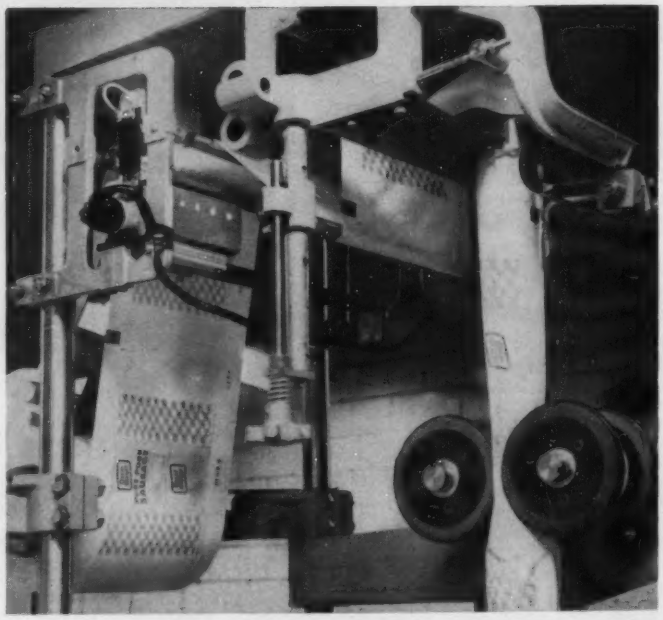
Equip for New Package Materials

Improved films and containers can bring you operational and merchandising bonuses . . . But their peak performance requires the right machines



LOW-COST plastic films bring big savings when automatically applied. Here, film from roll is tube-formed, filled, and sealed to produce chub packages of sausage. This knocks off a penny per unit in cost and makes neat wrap.

TODAY'S PACKAGE totes a bigger load in tapping plus-markets for existing products, and establishing sales beachheads for new items. So the combination of up-to-date packaging materials and equipment has become a potent force behind marketing leadership.

New and improved container materials that offer stronger product protection, bigger operating economies, more convenience, and sharper merchandising effectiveness are building profits—but only where you have equipment to efficiently handle these materials.

Three types of materials keynote the need for modern packaging line units: (1) Polyethylene and other films (polypropylene, nylon, polystyrene, and polyester). (2) Aluminum for rigid, semi-rigid, and flexible containers. (3) Leak-proof cartons that eliminate inner-liners and overwraps.

Low cost and newer formulations are widening polyethylene's applications as an overwrap (it's already scored as a bread wrap) and as a protective coating for cartons.

New Principles Needed

Although food firms have tried to run this film on existing cellowrap machines, results have been either inconsistent, at best, or disappointing. New concepts in machine handling—especially for sealing—are dictated by the film's limpness and other characteristics. A start has been made in designing line units especially for polyethylene, but speeds are modest—from 27 to 80 units/min. (656).

Poly-coated board is growing fast—such as stain-resistant cartons for meats and baked goods, and frozen food boxes that must stand up under pouring of hot foods and immediate fast-freezing. Indications point to milk cartons as the next big breakthrough—in fact, a prototype model for applying a plastic coating at the dairy plant level is now in the test stage (657).

Advantages here would be greater leak-proof protection, elimination of chipping, and less carton bulging. And once poly-coated milk cartons catch on, look for other dairy products to get the same treatment.

Of course, mechanical units for fast-handling of other plastic films are always coming along. Take, for example, the improved pouchers that form-fill-seal from roll stock, a semi-automatic wrapper for the new saran-type polymer, and automatic equipment for rubber hydrochloride and extruded vinyl films.

And constant improvements shape the older films to new uses. The K-type or polymer-coated cellophanes which extend product shelf-life and resist fogging, are extending the applications. Furthermore, laminations are scoring as successful answers to specific packaging problems—for example, the paper-foil-polyethylene combination that ended a long search for a low-cost protective unit for angel food cake mix and the new dehydrated potato flakes.

Is your packaging line geared to run such materials?

Aluminum's use in various forms is being accelerated by new forming and handling equipment. Spurred by the food maker's desire to get away from tinplate costs, achieve shipping economies, and exploit the containers merchandising appeal, aluminum cans are poised for a big boom. And since the cans can be made right in your own plant (with

PLAN '59 GROWTH/PROFITS

impact-extrusion units that form container from a slug), you can benefit from a completely integrated run-through product packaging line (658).

Development of better rigid foil packages has paved the way for improved closing units that replace hand-operated equipment with automatic handling. High-speed machine crimpers, end-seal overwrappers for seamless full-curl containers, and automatic tray and cover feeders help to reduce costs as well as save on foil (659).

New Look in Boards

Improved food boards have triggered wider use of linerless printed cartons that eliminate overwraps—and bring big packaging economies. You use less material and eliminate operations. Also, lower maintenance costs are assured for those manufacturers who complain that downtime on overwrappers exceeds that of filling units.

Thermoplastic sealers (which facilitate use of new protective coatings and blends) increase the utility of these cartons as do cold-glue applications. Furthermore, the "hard-to-open" bugaboo is eliminated with built-in tear-strip devices.

A recent dual development along this line is a new economical, liquid-tight paperboard carton for frozen foods, and a new machine for filling and sealing it at high speeds. Aimed at replacing the metal-end container, the package has greater convenience appeal (660).

Steady improvements in plastic, aluminum, and board containers have boosted the convenience value of your package. Here are some developments that will help your packaging operation:

▶ **"Cook-in" units.** A new glue-type carton is foil-laminated on both sides, allowing direct baking in the oven. . . . A boil-in pouch (for instant cereals and processed rice) acts like a tea bag—lets water come in contact with the product but keeps food inside the pouch.

▶ **Inner-wrapped units** (like those used for cookies and biscuits) that provide uniform portions of a greater variety of products, such as ice cream and frozen desserts.

▶ **Pressure-dispensed containers** that extend aerosol packaging to a wider range of foods. Just out is a complete high-speed manufacturing line that cuts unit costs (661).

▶ **Multiple packs** that are more efficiently assembled by units that handle assorted package sizes and take up minimum floor space (662).

—FE Staff

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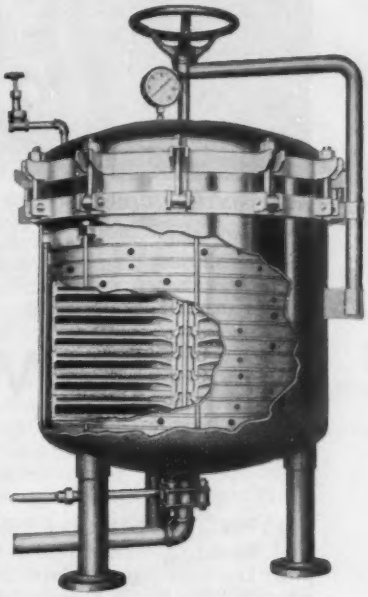
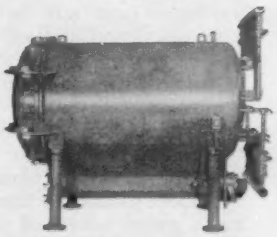
Completely stainless steel filters having access to all plate surfaces for thorough cleaning fulfill food industry sanitation requirements.

Design variations of the Standard Horizontal Plate Filter enable sugar units to be offered in a wide range of models and capacities at economical prices.

WRITE SUGAR DEPT. for additional information on Sparkler's complete line of sugar filtration equipment.



The SPARKLER Standard Horizontal Plate Filter



The SPARKLER RSC sugar refinery filter

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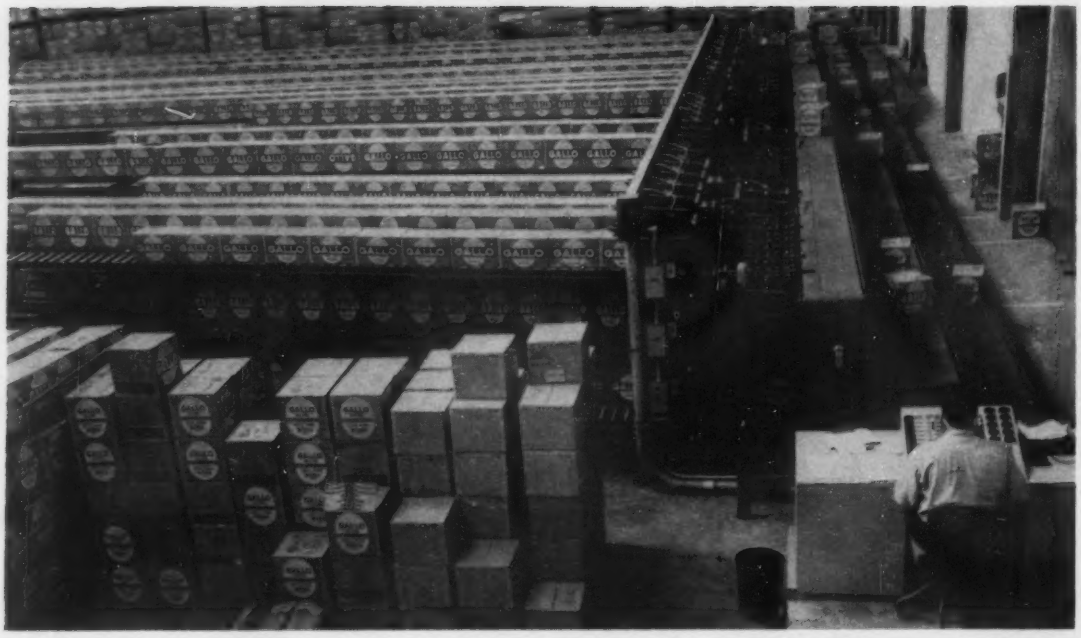


AUTOMATED ORDER MAKEUP enables console operator to "button-select" commodity and quantity, start assembled cases moving on discharge conveyors. Labor savings are tremendous, mishandling losses are curbed.

Keeping Warehouse Costs Down . . .

STEPPED-UP TEMPO of today's food marketing—with turnover the profit key—casts your warehouse in a new role. No longer a simple storage facility (when the guiding principle was "ship when packed"), your warehouse must now be integrated with production and sales. And to do the job efficiently, it must be automated with modern handling equipment.

Warehousing's new distribution function is the result of a squeeze from two industry cross-currents—high-speed production lines that turn out a greater variety of products in swelling volume, and big-ticket buyers who want smaller orders delivered more frequently. This puts an operating premium on modern equipment that prevents logjams between production and distribution, improves customer service, and clamps a lid on storage costs.

The most important equipment advances have been in mechanized handling systems and electronic control setups that automate case handling, replace manual labor with powerized flow-through and, most significantly, transform the warehouse into an integrated distribution center.

These are profit strides you make with this new equipment: Bigger ratio of output per man-hour, faster processing-filling-handling of orders, and minimum capital tied up in inventory.

To illustrate—

An electro-mechanical order-makeup system enables a West Coast wine distributor to fill orders faster with one-third less labor, trim losses previously incurred by inaccurate manual order-assembly, and reduce container breakage.

Handling arrangement includes a bank of gravity conveyors, each of which discharges to its own take-away belt. Operator at computer console throws switches that select commodity and quantity, and assembles the completed order. Traffic monitor controls the feed from the three belts to a single power-driven conveyor that takes assembled cases to palletizing point (663).

A similar electronic case-routing method at a Midwest bakery mix plant employs paper-punch tapes as "memory" circuits, automatic elevator control for jib crane operation, and static control units (for coding and decoding work ordinarily done by conventional relay circuits).

Acting on electronic instructions from the "memory" units, dispatch board actuates automatic elevators that position jib crane to deliver preset type and quantity of cases over any one of 72 "live-storage" conveyors to shipping point.

Capable of sorting and handling

FASTER LOADING is provided by this control panel that puts palletized loads on "run-through" basis. Automatic counters deliver any number of cases from any of 7 product lines to designated shipping docks.

. . . is "pushbutton engineered" in new control systems that replace manual handling, speed flow of cased goods, and minimize capital-eating inventory

31 different products at a rate of 40,000 cartons a day, this robot system enables the baker to up production about 30% with less labor, cut warehouse floor-handling of cased goods 80%, synchronize scheduling of production with shipments, and eliminate extra handlings since about 80% of each day's output is shipped directly from "live" storage (664).

An Eastern brewer now profits from a smoother multi-item case flow as the result of a mechanized setup. A coordinated conveying-palletizing system pivots on a flexible dispatching arrangement that directs cartons either to manual truckloading docks in the main building or to three automatic palletizers in an adjacent structure.

Nerve center is a bank of railroad-type switches operated from a control at the dispatching station. Here, one man makes up all the orders and shunts a variable number of cases from any of the seven product lines to the proper loading dock. Deflectors channel cases from product line to the desired take-away conveyor.

Additional benefits: Faster loading, minimized floor stacking of cases, and simplified inventory control (665).

A southern brewer has virtually eliminated the need for storage area through electronic controls that synchronize the flow of outgoing packaged beer with incoming empty containers. Electric panel tells dispatcher how loading/unloading is going on at each of 39 car and truck docks, enables him to keep the plant on a "run-through" basis (666).

As customer service reshapes the warehouse's function, electronic data processing that slashes paperwork becomes a more necessary part of streamlined distribution techniques. A Midwest baked goods manufacturer gets more out of his warehousing facilities by combining integrated case sorting with electronic "brain" units.

Punch cards inform the production department of what's on hand and what has to be run off (thus smoothing advance scheduling), tell shipping where stock is located among the various storage bays (thus speeding order assembly), and enable accounting to keep a tighter inventory control (and reduce the amount of capital tied up in on-hand stocks).

As a result, customer service is sharper, since fast-turnover items are on store shelves when needed, and stock rotation is smoother (667).

Self-Loaders Bring Savings

Automatic pallet loaders—that receive cartons from sealing machines, stack them on pallets in the desired pattern, and eject the loaded pallet—slash labor costs, arrange cases more compactly with less breakage, and enable the output of several packaging lines to be palletized at one point. Savings have been reported at $8,100/yr. on a one-shift operation involving 15 cartons/min. (668).

Handling costs have also been trimmed by improvements in more conventional warehouse equipment. For example, advances in fork-lift and industrial trucks include: Telescoping masts that lift pallets to ceiling height and retract for passage under low boxcar doors, greater maneuverability in cramped aisles, self-contained battery chargers that replace central charging point, optional attachments for use in subfreezing areas, side-shifting for pinpoint positioning of loads, and functional clamps (including hydraulic types for palletless handling, and suction cups) (669).

Order assembly has been sped by mechanical tow lines (overhead or in-the-floor), storage flow racks that reportedly cut picking time in half, and turntable conveyors that eliminate multiple handling, save on space, and bear cases to desired location (670).

And for faster loading/unloading there are dock levellers that adjust carrier and platform heights, covered docks for all-weather operation, and telescoping conveyors that do away with extra platform handling (671).

As mechanization makes greater strides, the day of the all-automated warehouse draws nearer. One such structure, now in the planning stage, is said to offer a 75% saving in the structural shell as well as an annual saving of $225,000 in labor (672).

—*FE Staff*

DEMOUNTABLE TRUCK BODY is lifted from flat car, placed on waiting delivery truck. Reloading costs are abolished, service to retail customers is sped, and refrigerated products get straight-through protection.

To Move Your Goods

New transportation equipment makes traffic dollar more productive by: Speeding dock-side handling, trimming damage claims, and stretching distribution flexibility

BETTER PRODUCT protection is assured by this new "air-locked" bulkhead method of freight loading which uses rubber-lined sacks that hang from overhead trolley.

TRANSPORTATION COSTS often hold the key as to whether or not you'll get into a specific market. And if they're out of line, you'll find it rough-going to keep your products competitive price-wise.

Here's proof that the cost of shipping goods can be critical to your marketing program: In the past 10 yr., while the retail cost of food increased 38%, the marketing bill jumped 73%. And transportation costs leaped even higher—up 85%, in fact.

To make their traffic dollar stretch further, and offset rising freight rates, industry leaders are making greater use of new and improved transportation equipment that (1) provides bigger payloads per carrier unit, (2) increases distribution flexibility, (3) reduces costly handling, (4) speeds loading and unloading, (5) gives merchandise better in-transit protection, and (6) improve transport practices.

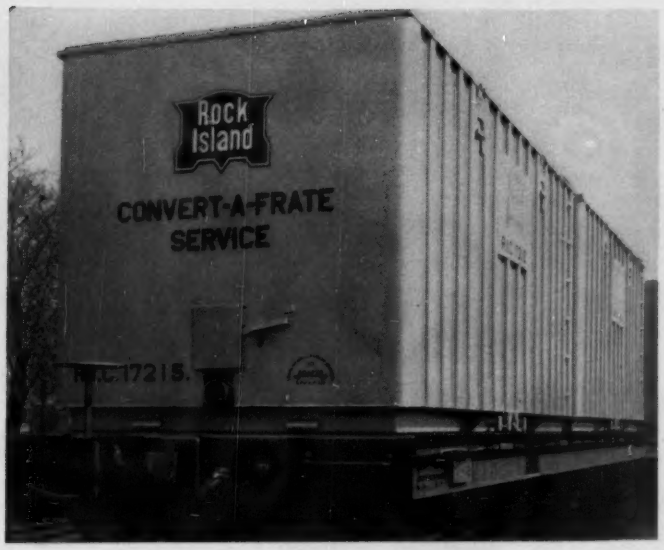
Several innovations in over-the-road equipment enable you to cut unit costs by shipping more at one time. Helping out are use of lighter metals (as aluminum) and plastic materials, longer body lengths (made possible through cab-over-engine construction), and hi-cube trailer designs.

More load space—as well as less insulation and reduced maintenance—are three of the benefits brought to a Midwest meat packer by a new molded plastic truck body. Front, top, sides, and rear are molded in one piece, then hermetically sealed to floor (673).

Two-for-One

In-transit product protection has been enhanced by the new demountable truck bodies. And greater use flexibility, plus less handling, are two additional benefits.

One typical 'demountable' consists of two principal parts: (1) Rectangular, hydraulically operated framework mounted on truck or trailer chassis, and (2) a set of four steel tubed legs that recess into the outer-body sides when not in use and which swing down to support the



CARGO UNITS for bulk materials or assorted packaged goods are curbing labor costs through simplified handling.

Faster and Cheaper

body when needed (674).

Ordinarily, two or more bodies are used with the same chassis—one being loaded at the plant while the other one is in delivery service—to increase productivity time on the route and permit daytime loading.

A leading Midwest firm uses several demountable bodies to speed deliveries, avoid reloading costs, and provide straight-through protection of meat products, from packing plant to retail store. Employed are 12-ft. bodies (short enough to fit onto tilt-cab delivery trucks) which are loaded four at a time at the packing plant, then shipped to key distribution points via railway flat car (equipped with electric generator for the dry-ice fans that protect the meat).

At the receiving point, the bodies are transferred to waiting trucks and sped to store customers—without any reloading.

Faster loading and unloading—which slashes labor handling costs—has been spurred by modern carrier equipment. For example, there's a new pushbutton floor-conveyor system for trailers that halves loading/unloading time. Mounted on the vehicle's floor, it "walks" palletized loads in and out of the trailer (675).

A similar unit, used by a West Coast brewer, knocks 75% off loading/unloading time. Retractable roller assemblies, spaced to accommodate typical pallet sizes, are raised (to elevate pallets for fork-truck blades) or retracted (to let pallets rest on the floor) by hydraulically operated cams (676).

Another area where modern equipment brings operating dividends is in the promotion of more efficient transport practices.

For rail shipments, there's the compartmentized car, equipped with internal, movable bulkheads or doors that: (1) Divide the car into three variable size areas, and (2) help secure the load. A leading canner reports these cars have cut his damage claims almost to zero, eliminated handling confusion at stop-off points (since loads are segregated for individual unloading), and reduced receiver unloading time (677).

The latest form of compartmentized loading, reportedly capable of cutting damage by 50 to 75%, involves rubber-lined sacks. These are inflated with compressed air to act as "air walls." Such inflated bulkheads help cushion the cargo securely (678).

For over-the-road hauls, there's the dual-load trailer which combines food products that have different temperature requirements. One Midwest firm, shipping frozen and dairy products in the same trailer, profits from fewer delivery trips (679).

Distribution flexibility—which grows more important with each new sales area you open up—has been enhanced by equipment improvements in piggy-back operations.

One of the latest innovations, introduced by an Eastern road, uses highway trailers with detachable wheels and standard flat cars with hydraulic lift-tables. Changeover from highway trailer to flat car (or vice versa) takes 4 min., much less time than is involved in anchoring wheeled vehicles to rails cars (680).

Also new is a flat car specifically designed for piggy-backing. Equipped with an automatic centering device that guides the trailer during the loading procedure, it costs 30% less than conventional flat cars (681).

Improved water transportation also gives more flexibility. Recently, a West Coast vintner shipped 2.4 million gallons of wine to the East Coast via a tankship. On return trips, the vessel carries liquid sugars, beverage, alcohol and edible oils (682).

Bulk orange juice is economically moved by boat (650,000 gal.) from Florida to New York. Vessel, equipped with insulated stainless steel tanks, makes the run in 2½ days.

Now that shipping by water is growing, opening of the St. Lawrence Seaway will mean new opportunities for low-cost transportation.

Keeping pace with improved carrier equipment are new shipping containers that simplify handling and protect the product better.

For example, a rubber-fabric container, resembling a giant toothpaste tube when filled, enables two-way hauls of solids and liquids in the same trailer. When filled, it holds 3,800 gal. for trailer use (683).

Cargo units, that act as their own shippers for bulk materials and assorted packaged goods, are holding the reins on transportation costs by reducing handling time (through simpler loading and reloading), offering better product protection, and lowering shipping charges.

The units can handle refrigerated or non-refrigerated foods. A typical 17-ft. shipper 500 cu. ft. capacity) is

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adaptable for truck, rail, or steamship

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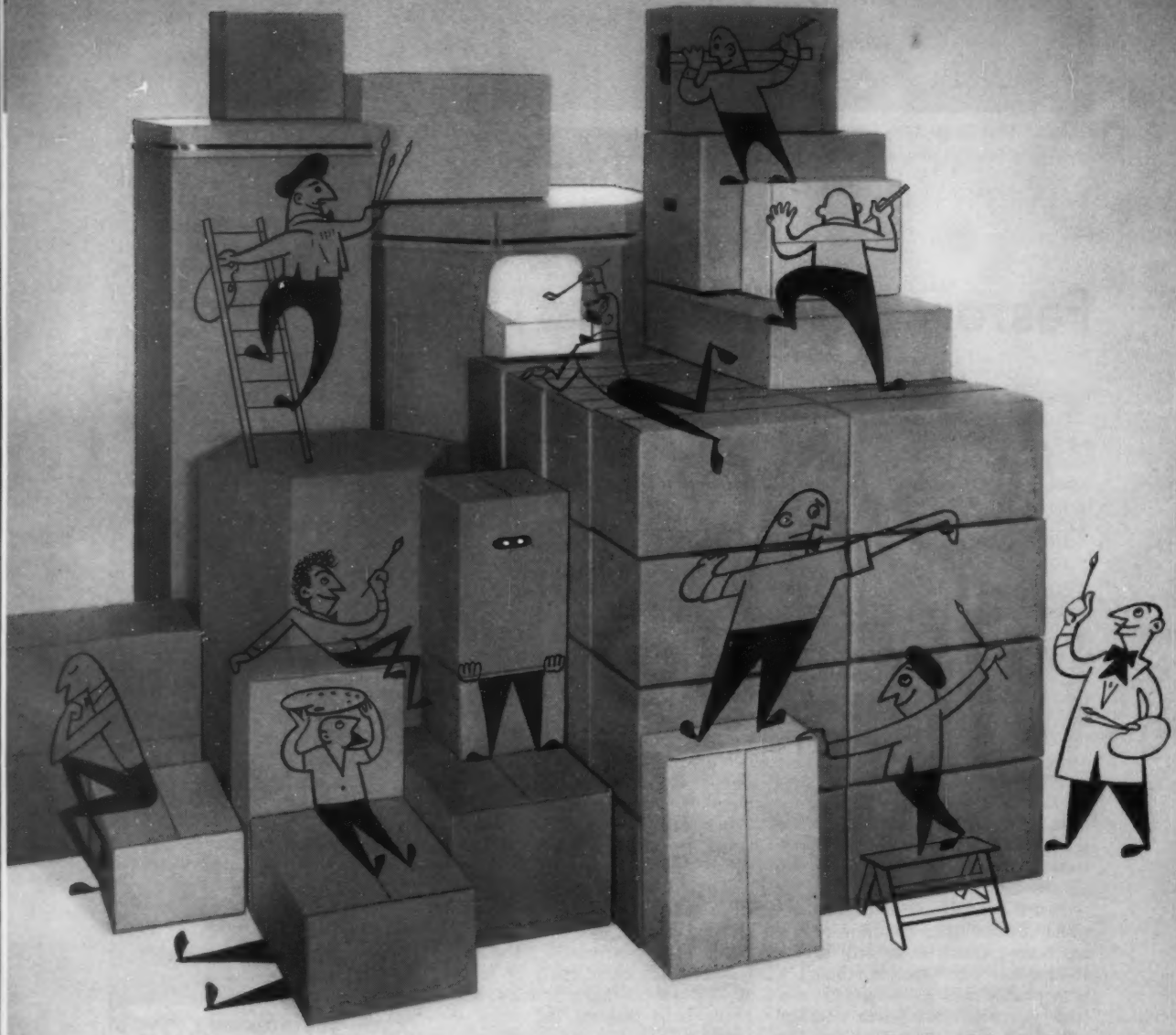

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Gaylord Boxes

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adaptable for truck, rail, or steamship handling (684).

Larger 900-cu. ft. containers are now used by brewers for receiving malt and cereal grain supplies. Holding 30,000 to 35,000 lb. the units are removed from flat cars by fork lifts, then upended at the plant by a hydraulic mechanism to permit malt grits to flow through an outlet gate into the storage area (685).

Other cost-cutting equipment coming in for wider use are unitized shippers (such as uniform pallets) and disposable pallets.

Big Labor Saving

A West Coast canner reports that, with its uniform palletizing, a fork-lift operator can load/unload a palletized car in ¾ of a man-hour—as against the 8 man-hours it took in the previous hand operation. Other benefits: Rate reductions (since less handling time is involved), no damage claims, faster turnaround of rolling stock.

Disposable pallets are now available in light and heavy duty models.

Manufacturers who maintain their own truck fleets are reaping operating dividends from:

. . . Tilt-cabs that make it easier to get at the engine for repairs.

. . . Truck-type automatic transmission that promises longer engine life, and greater fuel economy.

. . . Sliding tandems (on trailers) and sliding fifth wheels (on tractors) which permit axle adjustment.

Refrigerating units on carrier equipment have also been improved with an eye to better operations.

A new nose-mounted mechanical unit is shorter in length to allow use of a longer trailer body, and to reduce the necessary gap (for turning purposes) between the front of the trailer and the back of the tractor cab (686).

Fuel economies are achieved by a mechanical unit that employs a hydraulic pump driven off of the truck's own engine, replacing the extra gas engine previously used (687).

Mechanically refrigerated low-temperature railway cars that offer maximum protection on long-haul shipments are increasing in number. And mechanical units that both heat and cool by a reverse-cycle operation are available.

Air freight is gaining for special shipments that must get to their destinations in the quickest possible time. A special aluminum box has been developed for rushing fresh produce via airplane from the West Coast to New York. —*FE Staff*

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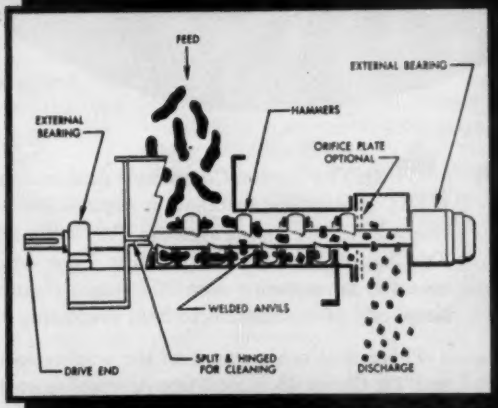

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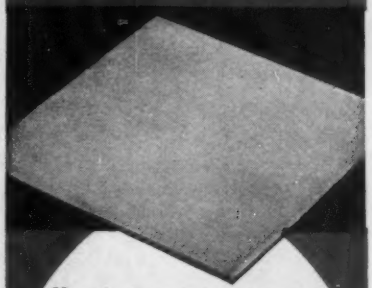

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VICTOR 475..highest quality, solid-woven cotton belting impregnated and coated with a special neoprene compound. Developed for use where laboratory cleanliness is a *must*. Washable with hot water or steam, resists rancidity and deterioration.

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This 16,000 lb. per hour HTST Pasteurizer and 2000 gallon per hour Homogenizer utilize a Tri-Clover Holding Tube Assembly and Tri-Clamp Fittings for highest efficiency in cleaned-in-place service.

Photo courtesy The Creamery Package Mfg. Co.

TRI-CLAMP
Snap-action spring clamp with toggle locking device
TRI-CLAMP
90 degree Sweep Ell available in all sizes, 1" thru 4" O.D.

In The Borden Company's modern Grand Rapids plant, this HTST pasteurizer installation typifies the very latest in efficient cleaned-in-place piping systems. Tri-Clover Division's stainless steel Tri-Clamp® Fittings and Holding Tube Assembly used here combine the labor-saving ease of in-place cleaning with cost-reducing simplicity of installation to hold processing costs to the minimum.

This is just one example of the way versatile Tri-Clamp Fittings and Tri-Clover Holding Tube Assemblies are serving the Dairy and Food Industries. It will pay you to find out how these and other quality controlled Tri-Clover products can help you achieve new standards of efficiency and sanitation in your processing operations.

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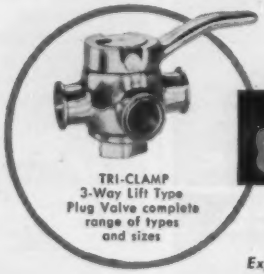

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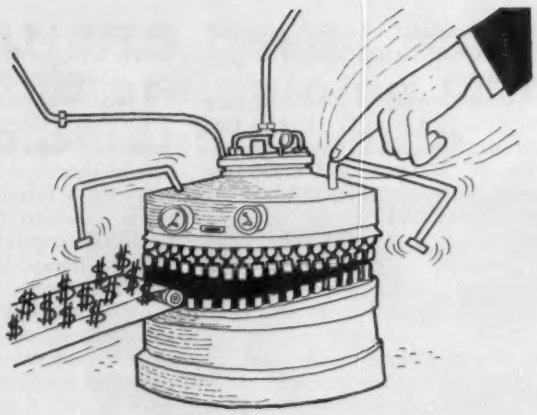
PLAN '59
GROWTH/PROFITS

How to put your finger on

Profit-Eating Machines



Which units need replacement? And what is it costing you to keep cripples going? . . . Here are practical ways to check old versus proposed new equipment—with sharp figures on the penalty you pay for failure to modernize

YOU CERTAINLY wouldn't use a hit-or-miss or hunch approach to gird your plant for the new boom. It's equally vital, however, that you don't get bogged down in overly-complex scientific formulas.

In between is the realistic way—backed by simple arithmetic—of spotting profit-gobbling equipment that should be replaced.

Need for this practical approach is evident when you compare the extremes: On the one hand, you've got a ticket to food-industry oblivion if you follow the policy of replacing nothing until it wears out.

On the other hand, buying every new unit that comes along, without evaluation, and whether or not you can afford it, will give you a plant full of beautiful machinery—to hand over to the receivers.

Having warned of these tangents, Robert G. Sutherin, of Read Standard Corp., York, Pa., recommends the simple, discerning attack: You check performance of your present units versus that of proposed new equipment, meanwhile carefully relating the economic factors, such as labor costs per unit produced.

Mere direct-charge factors will often give you the working base. If a new $12,000 machine will replace a $4,000-per-year worker, the unit would pay out in 3 yr. Or if it cost but $4,000 it could be charged off in a single year.

Here, a working form on which you can jot the key data (see illustration bottom of p. 94) will be a very handy "tool." This puts the pin on what a machine costs to operate, what it will save, and what should be charged against it—leading to your annual net savings figure.

Note the factors named. General maintenance can well be predicated as costing less for the new machine. Repair and overhaul should be less frequent. Many new pieces of equipment clean much easier—a big point, since sanitation charges on food machines can run quite a percentage of total labor. In fact, a unit that's simpler to clean generally is worth a greater investment *per se*.

As for supplies, a new unit—say a filler—may operate much more precisely, bringing notable savings in product give-away.

A number of other factors of a new machine call for your attention: Improved product quality, less skilled labor needed, flexibility for more product varieties, same item made for less cost, accidents reduced, worker morale boosted, uses less floor space.

Regarding the latter, space savings can run $10 and more a square foot. In some instances, machine replacements not justified on direct labor savings have turned out to pay off on space savings alone.

Upshot is that both tangibles and intangibles should be reckoned when comparing a modernizing installation against your old setup. The intangibles can sometimes add up to decisive savings.

Salient Tips and Tactics

• **Good records are a must.** Put down key data on each of your machines in handy-reference form—showing year it was built, capacity, original and replacement costs, power requirements, special maintenance needed, and any other pertinent information.

Here, precise forms may be used for evaluating the cost status of each new piece of equipment—perma-

You Must Keep Up to Date

In the strategy of equipment replacement, this is the first requisite: Keep abreast of the technology—through your industrial publications, attending shows, and contacts with equipment makers, with regular reference to their literature.

By "knowing the score" you make more realistic estimates. And this is vital, since your replacement calculations are only as good as the estimates that you bring to bear in the figuring.

Put flatly, obsolescence means that something better that you can put to use profitably is available. Here, the saying goes that a plant that needs new equipment is already paying for it—for your old units become expensive luxuries.

ment-file guides by which you may check actual savings against original estimates.

Accompanying is a sample form prepared by Glenn G. Hoskins Co., industrial consulting firm of Libertyville, Ill. It covers an $80,000 unit figured to save $20,000 yearly in direct labor and materials. Note how net savings accrue (last column).

True, a cash purchase would eliminate the interest payments on a unit, and thus add to savings. However, it's best to apply a going rate of interest, since funds used for buying the equipment might otherwise be earning that rate.

• **Review your whole plant,** not just single machines–since efficient plant operation is your aim, not merely betterment of one unit operation. Consider here the product itself relative to savings on raw materials, processing, packaging, and marketing. Life of new equipment may be shortened because the product itself is becoming obsolescent.

Also scrutinize the design and location of the plant for ideas on layout and transportation savings. Especially examine processing and materials handling factors.

Sometimes, replacing single machines won't save labor, but buying additional machines will. Thus, new units X and Z might still require the same handling labor. But getting a new unit Y—a conveyor connecting the two to make an XYZ flow—would turn the trick.

• **Rout out the bottlenecks.** Flow restrictions can too readily develop into actual bottlenecks. Mr. Suthcrin tells how an $11,000 high speed wrapper was the cure in a large bakery. It accelerated prior operations on the line–to the tune of a net annual saving of $5,208. Breakdown: $12,032 annual direct labor savings minus $1,181 in yearly interest, property taxes, depreciation, and insurance, and less $5,643 tax of 52% bracket.

• **Track down all angles** and you may find a replacement looking much better than it did at first blush. Example by Mr. Sutherin: A new $40,000 unit that was examined was initially seen saving two men, representing an $8,000 savings annually to pay for it over 5 yr. However, by putting the department on a 2-shift basis, there was double use of the unit, saving $16,000 annually in labor. And so the machine paid for itself in 2½ yr.

What's more, fixed charges (insurance, taxes, interest) remained the same, adding to the savings.

• **Color chart makes it graphic.** A strong visual check can be kept on your replacement needs with a plant equipment map on which units are colored according to physical age.

You might code-color your 1 to 5-yr.-old units green, 6-10 yr. machines blue, 11-25 yr. equipment yellow, and those units over 25 yr. red. Your first objective would be to abolish all the red from your map.

And you would make a routine critical examination of all units over 10 yr. old. One company classifies equipment on its replacement list as "U" or "D"–to distinguish whether it's *urgent* that it be replaced, or just *desirable*.

Units in the 6-10 yr. and even 1-5 yr. categories also should get careful eyeing at intervals, since comparative newness doesn't always safeguard a machine against economic or technologic obsolescence. Greater savings are sometimes posted by replacing "young" machines.

• **Flexibility can be primary.** You may well apply a "payoff period" or "return on investment" measure as a guide in replacing machines. Take care, however, that you don't adhere so closely to "rules" that the competition can slip in and lick you–for instance, a rule not to replace equipment until the old has paid off.

Generally favored is use of 3 to 5 yr. payoff periods, with recognition

PAYMENT FORM GIVES YARDSTICK for Checking New Unit's Actual Savings Against Initial Estimates

$80,000 UNIT depreciated over 10 yr. on a straight-line basis. Interest rate at 6%, with taxes 1% of depreciated value and insurance 1% of 75% of cost.

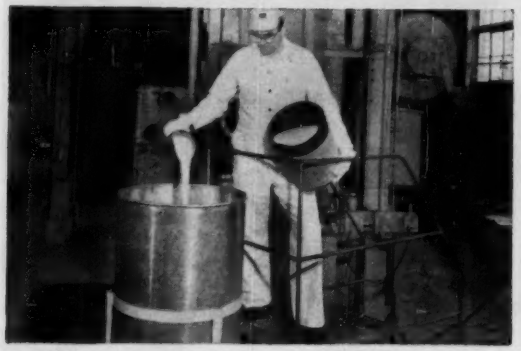
Yr.	Deprec. Value	Dir. Lab. & Materials	Taxes	Insur.	Maint.	Int. Pay	Pay on Princ.	Owed on Princ.	Net Savings
0	$80,000	20,000	...	...	...	.....	.....	80,000	.....
1	72,000	20,000	800	600	...	4,800	13,800	66,200	.....
2	64,000	20,000	720	600	...	4,000	14,680	51,520	.....
3	56,000	20,000	640	600	300	3,100	15,360	36,160	.....
4	48,000	20,000	560	600	300	2,200	16,340	19,820	.....
5	40,000	20,000	480	600	300	1,200	17,420	2,400	.....
6	32,000	20,000	400	600	300	140	2,400	.....	16,160
7	24,000	20,000	320	600	400	.....	.....	.....	18,680
8	16,000	20,000	240	600	400	.....	.....	.....	18,760
9	8,000	20,000	160	600	500	.....	.....	.....	18,740
10	0	20,000	80	600	500	.....	.....	.....	18,820
								Total.....	$91,160

HANDY WORKING FORM Checks New Against Old

	New Machine (A)	Old Machine (B)
Direct labor	$.....	$.....
Power consumption	.....	.....
Property taxes	.....	.....
Insurance	.....	.....
Maintenance and repairs	.....	.....
Cleaning costs	.....	.....
Lube and fuel	.....	.....
Supplies	.....	.....
Other items	.....	.....
Totals	(A) $	(B) $
		Less (A) $.....
Annual savings, new unit		$
Less 52% tax		$.....
NET ANNUAL SAVINGS		$

Here are the reasons why—

DRY-ACID CLEANERS based on Du Pont Sulfamic Acid are gaining favor in industrial equipment cleaning

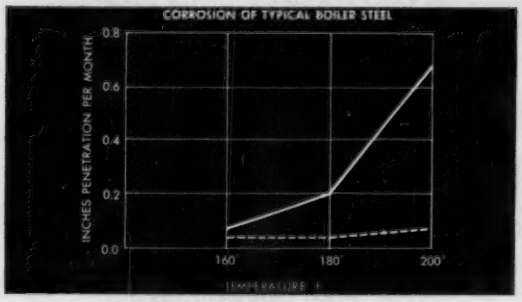


SAFER TO HANDLE—Dry-acid cleaners are dustless, free-flowing powders that *handle* dry. There's no danger of spillage, spatter of liquids or broken bottles.

EASIER TO USE—No siphoning or cumbersome pouring of liquid acid—just scoop or shovel dry acid into make-up tank.

LOWER HANDLING COSTS—Packaged in convenient, easily handled and stored, disposable drums in a variety of sizes. *100-lb.* drum is more than equal to one carboy of 18° hydrochloric acid (gross weight 192 lbs.).

NO HAZARDOUS FUMES—Dry-acid compounds are non-fuming, produce no corrosive gases . . . dry *or* in solution. Special precautions necessary in handling ordinary acids are eliminated.



_____ *Inhibited hydrochloric (5% HCl, by weight)*
- - - - - - - *Inhibited Sulfamic Acid (7% by weight)*

LESS CORROSIVE—Cleaners based on Du Pont Sulfamic Acid form solutions equal to hydrochloric acid in penetrating power, yet are far less corrosive (as shown by graph above).

Cleaners based on Du Pont Sulfamic Acid are ideal for removing hard-water scale and other mineral deposits from industrial equipment such as air conditioning and ice-making units, food-processing vessels, steam boilers, milk evaporators and pasteurizers, marine evaporators and heat exchangers.

We'll gladly send you additional information on sulfamic-acid-based cleaners and the names of formulators who offer these cleaning compounds. E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Dept., Room N-2533, Wilmington 98, Del.

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Grasselli Chemicals Dept., Rm. N-2533
Wilmington 98, Delaware

Please send me ( ) free booklet about dry-acid cleaners based on Du Pont Sulfamic Acid. ( ) Names of formulators who offer these cleaning compounds.

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*Firm*_____ *Title*_____

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*City*_____ *State*_____

For more data, circle 294 on Reader Service Card

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that you can thus hold yourself more financially ready for desirable new replacement moves. But beware the pitfalls. Many are tempted to "ride" on the paid-off machine—directly into creeping obsolescence. Many pass up opportunities by demanding too rapid payoff.

• **Keep your door open to new methods.** This is a good corollary—for a study may show that getting new machines that handle your operations in an entirely different way may be your real path to progress. And always consider complete revamping of an old process against adding costly improvements piecemeal.

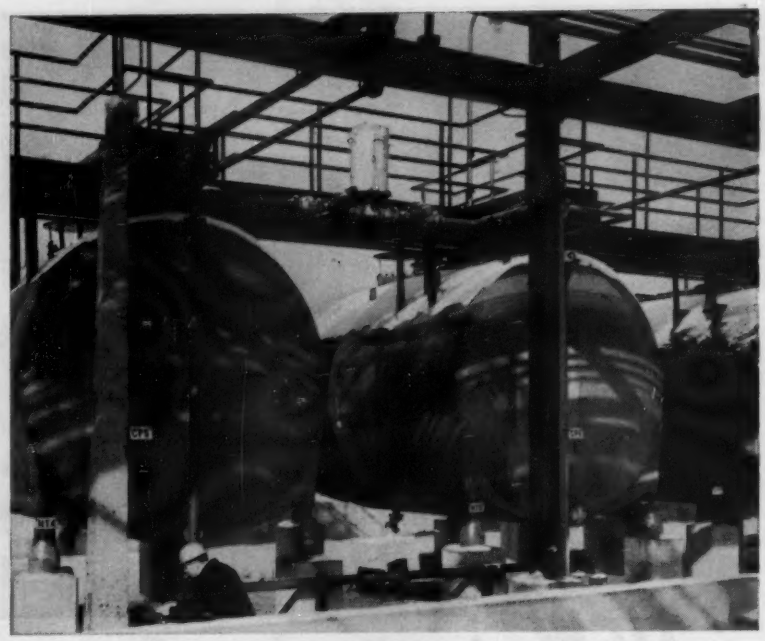
• **An assets-vs.-sales check may give the cue** that you need to invest in replacement equipment. A formula has been noted to bakers by Mr. Sutherin. He suggests gaging with a ratio of 1 to 6—that is, $1 of net assets to $6 of annual sales. Then if the ratio spreads, say to $8 sales for each $1 of assets, it might mean net worth has fallen too low due to running equipment long after it should have been written off.

The 1-6 method is offered only as an average to give you a fix point. There can be variables at work. For instance, if you run 24 hr. daily you'll be getting more sales for the same fixed assets. Further, dollar value at the time of original investment is an influential factor, also selling price of your goods.

• **Gage all operating angles.** You may, after tagging old equipment for removal, find that one choice for its replacement would raise your production 20% whereas another would lift it 30%. Still, the 20% equipment may be the best selection because the 30% installation requires additional personnel that isn't economically justified by the extra 10% productivity.

Another assumed case: Let's say that a $100,000 investment in new units would save you $30,000 yearly in labor, whereas a $170,000 outlay would save you $40,000 annually. Following the law of diminishing returns, it may not be advisable to up the investment another $70,000 for only an added $10,000 return.

• **Replacement instead of overhaul.** Not infrequently a unit requiring extensive overhaul is better scrapped, with a new machine replacing it. Assume a case where the overhaul charge is $2,400 and would extend the life of your machine by another 3 yr. This, then, would run you $800 per year. And it must be remembered that you'd face a new



Glassed-steel tanks are widely used for storing foods, especially where flavor can be affected by the presence of metal.

What flavor are your storage tanks?

Unlike many metals, glassed steel has no flavor.

Look then to Pfaudler glassed-steel tanks when you have an ingredient or food whose flavor you want to protect.

Acidic fruits, liquid sugars, flavorings, treated water, and the like are never contaminated by glassed steel.

Nor do such substances *corrode* glass, so you can expect longer than usual life from our glassed-steel tanks and they are economical.

The expression "smooth as glass" explains why you'll find cleaning much easier, too.

Pfaudler glass is permanently bonded, physically and chemically, to the steel. The glass can never shatter. This material has for many years been a standard in the pharmaceutical industry where sterility and noncontamination of product are paramount.

Pfaudler glassed-steel storage tanks run from 500 to 35,000 gallons in both vertical and horizontal designs. Tank openings are arranged to your requirements.

Check the coupon for more information on these tanks and other integrated food process equipment.

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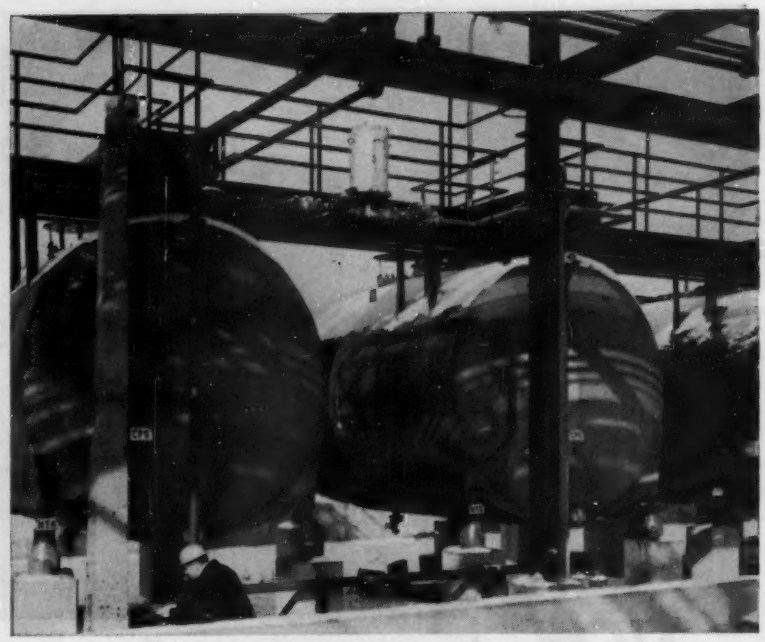

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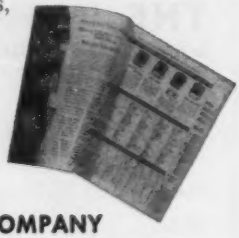
You can now meter hundreds of liquids... hot and cold water, syrups, oils, solvents, soap solutions and many chemicals. Auto-Stop meter capacities 5 to 300 gpm. Other Neptune features include ticket-printing registers and electrical Auto-Switch (shown above) to control pumps, valves or signals. Neptune Meters with simple counters or dials also available from ⅝ to 6 in. Ask for free technical metering Bulletin 566-OF



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expensive decision at the end of those 3 yr.

However, a new machine costing $5,000 would average only a $500 yearly expense on a 10-yr. write-off plan. That's better by a solid $300 per annum—and no doubt much more considering you're getting a new machine.

• **It's not always arithmetic.** Finally, if you get a signal of impending breakdown of key machines in your plant, then you'd better act fast—whether or not you've worked out the arithmetic.

Further on Formulas

The points given will enable you to shape a practical attack. You may, however, be prepared to go deeper. Here, the more intricate questions of machine replacement economics come into the picture. And it must be stated that some of the best minds have been challenged here.

Students of the subject hail the MAPI formula (Machinery & Allied Products Institute). In this system, the proposed new machine is termed the Challenger and the old unit the Defender. What is called the Adverse Minimum is figured out for each, and the one with the lowest A.M. gets the nod.

To explain: The Adverse Minimum of your old unit is reached by adding (1) its yearly loss in salvage value, (2) interest on its current salvage price, (3) any capital cost, and (4) its "operational inferiority." The latter is the performance difference between your old unit (upon which obsolescence and physical deterioration make inroads the moment it first begins to operate) and the best new machine. The A.M. figure for the new unit is a complex estimate evaluating prospective service life.

New methods, recently worked out, are simplifying the paper work.

Resembling the MAPI form is the Capital Equipment Replacement Analysis, a chart form developed by Allis-Chalmers Mfg. Co. Here, very detailed factors covering the proposed and existing equipment are run in paired columns for quick comparison, and calculations on lines at the bottom "work" the totals to determine the savings.

A third system is a simpler Work Sheet developed by the National Machine Tool Builders' Assn. This compares old and new units relative to direct and indirect (fringe benefit) labor costs and production performance. The capital recovery on the new machine investment is detailed to arrive at net savings.—*End.*

'59 PLAN GROWTH/PROFITS

5 Ways to Pay for It

—A succinct brief by an equipment-financing expert pointing out the major means by which you can cover costs of your modernization project

YOUR DECISION to modernize your plant is decidedly realistic in view of today's high premium on cost saving and big emphasis on price competition.

But, having made this decision and picked the particular equipment and methods you want to put to work, you then encounter the key question, "How should we pay for it?"

Obviously, there isn't one "ideal answer" for all companies—for no two concerns show exactly the same financial needs. Accordingly, you should begin by studying the broad financing map, carefully observing where the main roads—and side roads—lead. This way, you will be able to select the best route for your own specific projects.

Here are the basic 'arteries':

1—Modernizing Out of Cash. Prime criterion in this choice is whether you can pay for everything you need and still have left a sizable enough cash balance for all working purposes.

In more branches of the food industry there are seasonal or other factors making it essential to maintain a strong cash position. Look over your cash-flow projections and see.

2—Short-Term Borrowing. A short-period bank loan to cover your modernization moves can have several advantages—particularly, relatively-low cost, as expressed in percent of interest per annum. (Of course, businesses that the bank doesn't consider prime risks must figure on paying a premium rate.)

Provided the funds required are

DAVID L. SALINGER

Director, Industrial Division, Walter E. Heller & Co., national business-financing firm, with headquarters in Chicago

How Top Food Firms Finance

AS YOU FACE UP to major outlays for new equipment, you may likely say to yourself, "It would certainly sharpen my view if I knew just how leading companies in the industry go about it!"

On this point, FE now "fills in"—from answers to its "Case History Questionnaire." Top concerns replied to the query, "How are your capital expenditures financed?" Here are seven direct quotes—

"Through depreciation and retained earnings" . . . "Reserves from income and borrowing" . . . "Dozen of ways—banks, issue of more stock, out of income" . . . "Reinvested earnings and borrowed capital" . . . "Earnings and long-term borrowings" . . . "Draw on working capital" . . . "Primarily from retained earnings."

To the question, "Do you rent or lease any new equipment and, if so, what types?", a good number of companies replied in the affirmative—

"Yes, we both lease and rent. We lease warehouses, also most automotive equipment, and certain production equipment. Leasing sometimes costs less" . . . "Yes—our punch-card equipment" . . . 'Motor vehicles, refrigeration cabinets, also some new-building projects" . . . "IBM units, and very minor amounts of packaging equipment" . . . "Electronic data processors, punch-card units, autos and trucks, materials handling equipment."

A further question was, "Do you buy any equipment on installment-payment plans?" Here, however, "No" or "Very little" were the common replies from the top-level food organizations.

available from the bank in the necessary amounts and on sufficiently flexible terms, this method may be your best bet for money needed only temporarily and in moderate ratio to your volume of business or your capital.

Furthermore, when the timing is appropriate and the conditions for borrowing are good, banks are willing to renew the usual 60-day or 90-day note.

Also, if the background is favorable, the bank may be inclined to be lenient in granting extensions or moderate overloans.

Bad Times Alter Picture

Such bank arrangements sometimes can run on for years. But the national economic picture is not always favorable. Nor is the financial performance of the food processor always uniformly good.

The bank may become subject to excessive demand by the borrowing community. Sometimes, then, it may decide—on its own evaluation or that of the examiners—that it ought not to continue a given loan, much though it might like to.

3—Conventional Long-Term Borrowing. It can be seen from the above that many concerns initiating machine-replacement programs might prefer to keep their bank lines unimpaired against the possibility of special short-term needs. Decision, then, might be to finance the modernization through longer-term funds (debentures, for example), or through equity financing (common or preferred stock).

These methods can be ideal under certain conditions. For many food concerns, however, their feasibility may be limited. Moreover, these solutions, when once entered into, have the disadvantage of inflexibility in an industry where conditions are changing rapidly.

4—Funding Through Industrial Financing Companies. An alternate source to check for the longer-term modernization money is an industrial financing company, of which several are active in the food industry.

Sometimes they provide funds directly to the user; sometimes they assist the equipment distributor, who in turn sells them the user's obligation.

5—Installment Purchase, Leasing and Renting each pose their own specific considerations relative to financing. Without getting into the pros and cons of leasing vs. installment buying, let it be said that each method has its particular applications (see FE Nov. '57, p. 58-9).

In acquiring new equipment, you may be tempted to make some optimistic assumptions, such as that the units will "pay for themselves" out of earnings in a very short number of months, or that expected tax savings through leasing will somehow enable you to have your cake and eat it, too.

Any means of financing, especially in businesses such as those in the food field—where margin is generally low and based on high volume—has to be carefully keyed to the earnings potential of the user.

The author has sometimes been asked whether it is possible for a user to "just pay for new equipment out of depreciation"—or, more precisely expressed, to scale the amount of the monthly installments to the number of tax dollars saved through the depreciation charges.

Factual examination indicates you can't pay for it all in this fashion. However, depreciation figuring can cover a considerable portion of the total outlay.

Relative to "scaled payments" or "pay-as-you-earn" plans, you might well save financing charges by making your heaviest payments early in the life of the equipment, when maintenance costs are less and permissible depreciation charges under the Government's present tax code can be higher.

An initial payment (down-payment in the case of a purchase, or advance rental on a lease) has to be established in order to make the transaction financeable. This can vary within wide margins, depending on the nature of the equipment, its application, financial strength of the user, and so on.

And length of term needs to be established realistically: Too short a term is going to make for monthly payments that are too steep for the user to meet, while too long a term needlessly piles up his financing costs.

Your Own Status Is Vital

A user of equipment often will query a prospective lender, "How do you decide how much credit-extension is good for me to be carrying on the purchase of my new equipment?"

There is no formula. But business-financing companies like ours generally base their judgment and advice on three sets of facts:

A. The balance sheet and profit-and-loss statement—sometimes going back for a period of several years. Companies with substantial worth, high ratio of liquidity, and profitable past performance are naturally more preferred risks—and better able to make profitable use of modern equipment than companies with the reverse characteristics.

B. However, financial figures are by no means the whole story. The new methods and equipment in themselves will have an impact on the user's operation, hence are strongly considered in measuring credit.

C. And perhaps most important of all is the caliber of the management people who are seeking the credit—their reputation and background, their competence as operators, their imagination and aggressiveness as merchandisers.

So be sure to give the lender adequate facts in all these very pertinent areas.

It may generally be figured that, with the variety of financing arrangements available today, any company that can profitably pay for the use of modern equipment should be able to arrange a plan suited to its particular needs.

But a point to consider here is that successful applications of modern methods and equipment should

Congress Makes It a Bit Easier

PROMISE for further improvements in the modernization-financing picture is seen in the recent action by Congress that brought easier loan arrangements and faster write-offs for smaller businesses.

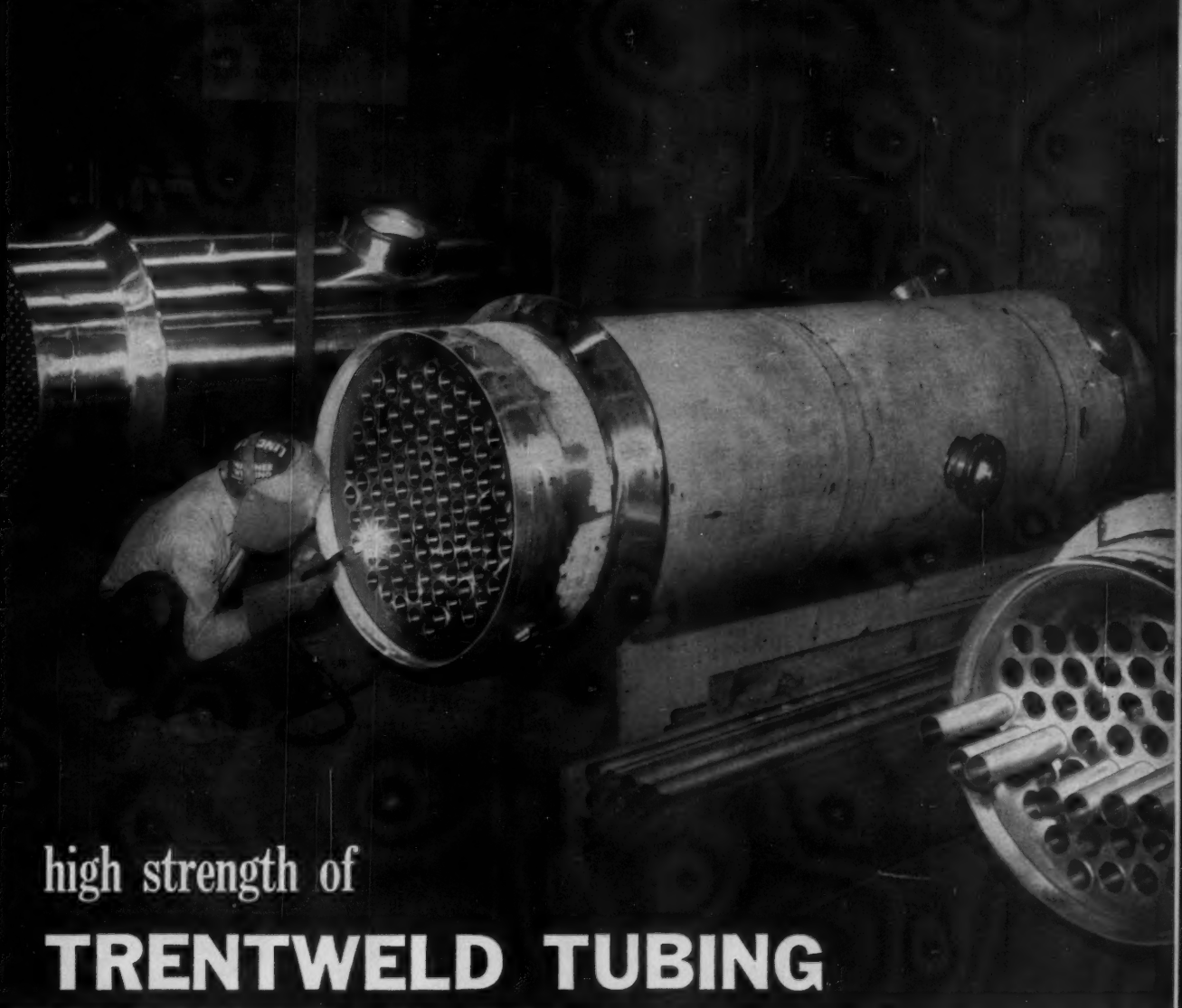
Ceilings on individual loans were raised from $250,000 to $350,000, as the Small Business Administration became a permanent agency. Further, a $250-million revolving fund was set up for new private banks—an aid in providing long-term loans.

The write-off provision allows first-year deduction from taxable income of 20% of the cost of new equipment. There's a limit, however, of $10,000 (or $20,000 in a joint return).

Also of note was this clarification in the excise-tax field: Leased business machines, trucks, and other units cannot be taxed at a higher rate than would apply if they were purchased outright.

For more data, circle 298 on Reader Service Card

These Blaw-Knox steamchests show how (right) Trentweld tubes are inserted, (center) gas fusion welded to the tube sheet, and (left) welded and polished to well-rounded joints which leave no corners or crevices for bacteria or corrosion build-up.



high strength of TRENTWELD TUBING

reduces a steamchest's weight, increases its service life

Here's a case where the high strength of Trentweld® tubing reduced a steamchest's over-all weight while (1) increasing its service life, (2) improving heat transfer, (3) eliminating possible sanitation problems, and (4) reducing clean-up work.

These steamchests, made by Blaw-Knox Company for heating milk, frequently contain 3,000 feet of stainless steel tubing. Previously, Blaw-Knox expanded heavy-wall tubes into the tube sheet. Now, using welding techniques developed by Trent's Technical Service Group and Blaw-Knox welding supervisors, workers easily weld lighter gauge Trentweld tubes to the sheet and polish the joints. This eliminates any chance of bacteria growth during processing and of crevice corrosion during clean-up.

Trent's Technical Service Group can help you improve your product with Trentweld tubing, too. That's because Trent's exclusive welding process virtually eliminates any beads or undercuts, and because Trent cold works and anneals its tubing to make the weld as strong and corrosion resistant as the parent metal. The result? *Tubing that's as strong and uniform as tubing made by any other method.*

Mail coupon for catalog . . .

CONTOUR TRENTWELD TUBING is available in sizes ranging from ⅛" to 40" O.D. and grades including Hastelloy,* Zirconium, Zircaloy, Titanium, 19-9-DL—for applications in every industry.

*Trademark of Haynes Stellite Co.

CONTOUR TRENTWELD

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Subsidiary of Crucible Steel Company of America

General Offices: East Troy, Wisconsin*

Gentlemen:
Please send me the *free* 48-page Trent tubing handbook.

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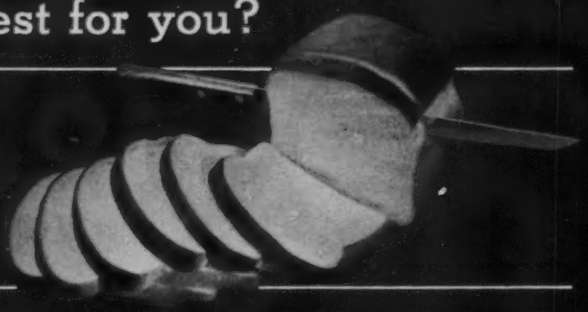
***Or write: Trent Tube Company, Fullerton, Calif.**

Which milk product is best for you?

Sweet Dairy Whey

A superior dairy ingredient that improves quality and reduces cost



Lactose

The low-sweetening milk sugar that works wonders in food formulas

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Powdered Milks

Whole milk (28% and 26% fat), High Heat, Low Heat and Instant Nonfat Dry Milk... all of extra grade quality

Angel-Whip

High quality, low cost whipping agent that increases tenderness, shortness and shelf life

ASK THE MAN FROM WESTERN

THE Man from Western knows the answers to your milk problems.

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Every Western product...from pure Lactose to powdered whole milk...meets rigid quality control standards. Buy them individually or in prepared blends for particular applications. You can depend on each lot to deliver uniform results.

Let the Man from Western show you how these rich dairy ingredients can improve your products and profits. He'll be happy to furnish you working samples and detailed technical bulletins. Or write: Technical Service, Department 16K. (Be sure to state application.)

Valley Fresh

Western Condensing Company

Appleton, Wisconsin

WORLD-WIDE SUPPLIER OF HIGH-QUALITY MILK DERIVATIVES

mean increased volume, with necessity for stocking more inventory and carrying more receivables. Thus, companies may need to arrange—at the same time that they finance their plant modernization—to obtain working capital advances to carry additional operating loads.

So, be sure to calculate the effect of your plant-modernizing program on your working-capital position, and to arrange foresightedly and concretely for financing means to accommodate this position.

Why They Modernize

Our own rather extensive financing of food concerns would indicate that modernization is generally undertaken today to accomplish one or more of the following paramount needs:

First, reduction of costs, which requires new labor-saving and expense-cutting equipment—and requires it now.

Second, improvement of packaging and marketing methods—as a more successful means of surmounting the competition than merely meeting the other man's prices.

Third, development of new items to keep up volume and to more-than-make-up-for market shrinkages on some of the older products.

Concerns that are best able to solve these questions will lead the field—will more significantly satisfy the greater market being created by long-range trends in population, incomes, and eating habits.

As a final check-point: Are you sure that your company is living up to its opportunities? —*End*

"I wish the old man wouldn't be so danged dramatic about timing the process!"

SIFTING?

...do it better, faster, at greater profit with

DAY

ro-ball sifters

Choosing from the long line of standard Day Ro-ball Sifters offers many advantages, including: six different sizes—one to four screens (single screen units carried in stock)—two to five separations—gyrating action—super active ball cleaning—rugged heavy duty construction.

If your production requires sifting, you'll want a Day Ro-ball Sifter data sheet, listing all dimensions and specifications. Write today.

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COSMETICS
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DETERGENTS

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DAY Ro-ball Sanitary Sifter, just added to our line of sifters, is designed to meet all requirements of the Dairy Institute Code for Grade A Products.

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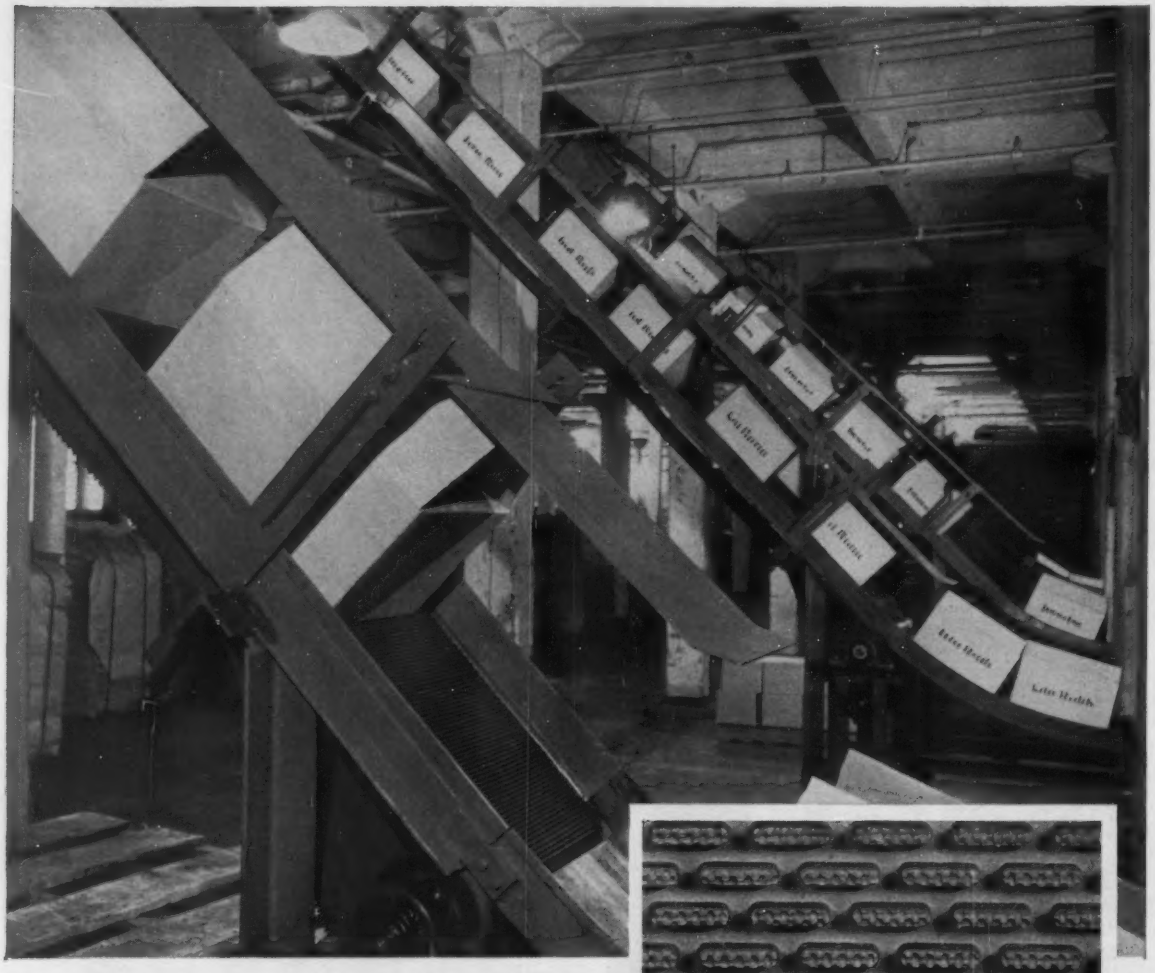
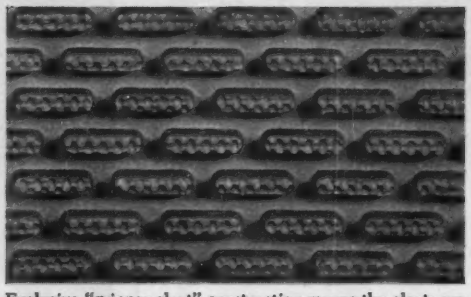
Division of the Cleveland Automatic Machine Company

SERVING THE PROCESS INDUSTRY SINCE 1887

4924 BEECH STREET, CINCINNATI 12, OHIO

US RUBBER **STEEPGRADE CONVEYOR BELTING**





Exclusive "gripper cleat" construction means the cleats are *not* attached or cut in; they are *molded*—a true and integral part of the belt—and cannot be torn off by heavy boxes.

Whatever became of Gravity?

It's hard to believe that these cartons are not nailed down to the U. S. SteepGrade Belts, so steep is the angle of descent. The scene is the American Can Company's plant in Baltimore, Md., and these light, smooth-finished cartons are being carried at an angle of 45 degrees—*with no slippage.* The sharp angle is necessary because existing floor beams and walls limit the space.

Before the installation of U. S. SteepGrade Belts (there are 10 in all) the cartons went down chutes. This often caused pile-ups at the bottom, with spilled cans, broken cartons and lost tempers. But SteepGrade now offers controlled descent, with cartons evenly spaced. Exclusive "gripper cleat" construction holds the cartons firmly—even at steep, gravity-defying angles—thereby saving valuable floor space, conveyor length and belt footage.

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and the finest quality industrial rubber products.

US RUBBER **Mechanical Goods Division**

United States Rubber

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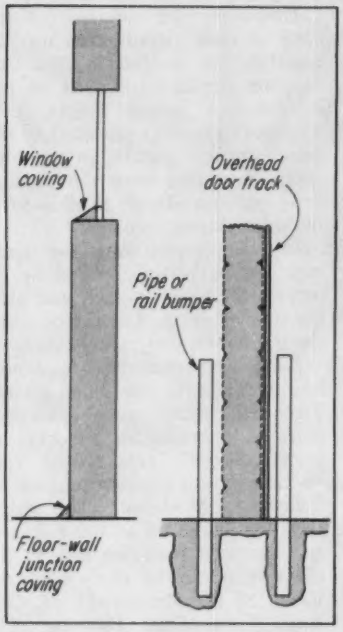


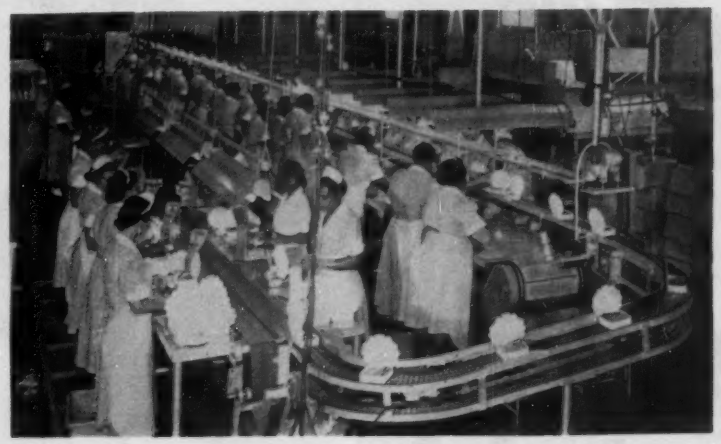
Steel Rails Protect Doorways

During the last few years, many new buildings and additions to others have been constructed of concrete blocks. This has been particularly true of garages and warehouses associated with food processing plants.

In these buildings, doorways used for delivery truck entry as well as by tow or fork lift trucks are extremely vulnerable to damage from them.

Here's a method of preventing this damage. Pieces of railroad rail or 3-in. pipe are embedded in the concrete floor and driveway 3-4 in. from edge of door (right diagram). These guards should be installed both inside and outside of the door. They should extend 12-18 in. below the floor and 3-4 ft. above, depending on type of trucks that use the door.

And here's another idea. When constructing a new building of the above type, cleaning is facilitated by coving up all window ledges and floor-wall junctions (left drawing). Dirt and dust will not collect as easily as on flat surfaces, and when they do, they are more easily removed. It is also a good idea to cove up around vertical "I" beams so dirt will not collect in the inside surfaces.—*John M. Stanley, Preventive Sanitation Consultant, St. Louis.*



This 180-Deg. Stainless Conveyor Solves Package-Transfer Problem

Here's how a frozen food packer overcame a space problem and, at the same time, reduced his labor cost.

At the Bridgeville, Del., plant of John H. Dulany & Son, movement of manually filled cartons of asparagus from packing line to checkweighers posed quite a problem.

The cleaned asparagus is belt-conveyed from washers to a line of women who transfer them to cartons.

As they were filled, packages were placed on a rubber belt which discharged them onto a straight gravity roller conveyor at right angles to it. The roller, in turn, fed the packages to another belt (perpendicular to it) that moved them to checkweighing stations directly behind the packing line.

Transfer of packages between belts and rollers resulted in pile-ups that eventually necessitated stationing one employee beside the gravity roller conveyor.

A slight change in line equipment has now overcome the difficulty. In place of the straight line roller, company installed a 6-in.-wide stainless belt (Omniflex, Ashworth Bros.) that conveys the filled packages around a 180-deg. turn (foreground in photo). Now, packages move smoothly from filling line to checkweighers without need for the attendant.—*F. W. Hale, Winchester, Va.*

Trouble-Free Can Conveyor

Here's a simple way of conveying cans up an incline without using flights to prevent them from sliding or toppling over.

Install, like we did, a regular No. 40 roller chain conveyor between a pair of guide rails (see photo). There's enough space between the chain links to hold the cans and prevent them from sliding as they are conveyed up an incline.

Installation comprises a 30-ft. length of chain to carry cans from rotary feed disk at discharge end of

Atlas

ENGINEERED FLOORS PROVIDE POSITIVE PROTECTION

. . . from bacteria and corrosion!

Atlas Food Plant Floors provide positive protection against a wide range of corrosives—from the most aggressive food acids to today's strongest cleaning agents. Since they are not attacked they are completely sanitary and offer no haven where harmful bacteria can collect and germinate.

Individually engineered to your exact specifications, these floors combine permanent attractiveness and wearability that eliminates costly maintenance.

For complete information write for your free copy of Bulletin 3-2.

ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

closing machine to a transverse conveyor. Latter is about 10 ft. above canning-room floor, and feeds canned fruits to the continuous cooker.—*Lloyd Phillips, Plant Superintendent, Michigan Fruit Canners, Inc., Benton Harbor.*

Spiked Dipping Rack Speeds Cheese Waxing

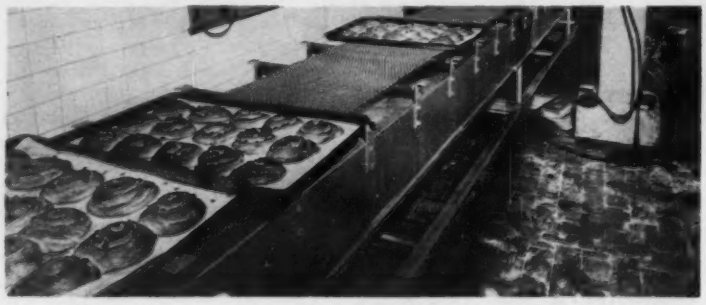
Here's a method we devised for waxing wheels of cheese that has reduced time required from 12.77 sec. to 8.42 sec., and gave us a better appearing package.

Wheels of cheese normally are placed on two rails while being immersed in wax. The scars resulting when the cheese is removed are coated by brushing with hot wax. But this procedure is slow and messy because the wax drips badly.

Employing the principle of the "bed of nails" stunt often used at carnivals, we designed a rack that supports the cheese wheels on numerous tiny points (photo left). The small openings produced by the points are not harmful in our blue cheese operation since the product is pierced immediately to allow gases to escape during curing.

In other applications, the openings can be partially sealed by removing the cheese quickly and placing it on a clean, flat surface while the wax is still soft.

Racks were made of 1-in. cyprus boards cut to fit our dipping tank. Twenty-five sharp pointed aluminum nails, of type used for attaching asbestos shingles, were spaced 1-in. on centers in a 5-in. square area for each wheel of cheese. The spiked rack was placed on an old rail rack, so conversion from the new to the old system can be easily made by lifting off the former.—*D. M. Graham, Assoc. Prof. Dairying, The Clemson Agricultural College, Clemson, S. C.*



Treadles Give Belts Dual Value

Here's how two foot treadles enabled Crusty Pie Co., Inc., Washington, D. C. to reduce labor more than 50% on its bun glazing line.

When the company installed a 40-ft. long by 18-in. wide galvanized wire mesh conveyor (Cambridge) to move pans of fresh baked buns through glazing and icing on the way to truck loading stations, it placed foot treadles at each end of the conveyor to control its movement.

Treadle at charge end of belt is operated when pans of buns are being removed from the oven. As operator places a pan on the belt he presses the treadle and moves the belt just far enough to provide sufficient space for another pan. This sequence is repeated until the oven is unloaded. Then he recharges the oven and starts the baking cycle.

During the baking cycle he has time to spray a glaze and an icing over the buns. Then he goes to the discharge end of the belt and presses the other treadle. This starts the belt and enables him to transfer the pans to special handling trucks.

One man can now perform the entire loading, icing, and unloading sequence, whereas two, and sometimes three, were formerly required. —*J. F. Reid, Cambridge, Md.*

 Circle 302 on Reader Service Card

For more data, circle 303 on Reader Service Card

Photo courtesy of Cities Service Oil Company (Delaware)

Now! Stack 30% higher...load into boxcars too!

The *Clarklift* fork trucks pictured above are demonstrating a new *dual* function. They stack 30% higher than equipment of similar, retracted mast height . . . can *also* drive through low boxcar doors and other tight clearances. It's made possible by Clark's new *Triple* Stage Upright.

Actually, it means you're getting two machines in one. You are able to take better advantage of the *full* height of your warehouse . . . yet, use the *same* fork truck for loading rail cars or highway trucks, low-door elevators, etc. The Triple Stage Upright enables your equipment to *work full time*, and on many *varied jobs* with no stacking height loss, no clearance problems, *no work stoppages.*

A specification sheet showing complete details is available on request. Simply write: Triple Stage Upright, Clark Equipment Company, Battle Creek, Michigan.

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Air-Blast Frees Bread From Cooling Tray

In the baking operation at Fuchs Baking Co., Miami, loaves of bread drop off end of a conveyor onto a grated cooling tray. In turn, the tray tips and the loaves drop onto a second conveyor.

But the hot loaves sometimes stuck to this tray. The trouble was eliminated by supplying air under pressure to underside of the tray to loosen the loaves.

A ¾-in. pipe 11 ft. long was used. Holes were drilled at 3-in. intervals and Alemite fittings inserted in them. Pipe was installed under tray and connected to the plant air line. Now, the air passes through the fittings and grating in bottom of tray loosening any loaves that stick to it.—*W. J. Holmes, Miami, Florida.*

PRACTICAL TIPS

● Asphalt-asbestos floor tiles can be quickly, easily, and accurately trimmed to desired size with a small bench-type power saw, using crosscut blade. Blade will be ruined in cutting 75-100 tiles, but saving in time will pay for new one.

● Long, wide, deep grooves can be quickly cut in lumber with rip and crosscut blades on an adjustable power saw. Put three or more blades on saw, separated by thin spacers if necessary to gain desired groove width. Adjust blade height to desired groove depth, then feed board through against ripping guide to insure that groove is parallel to edge.

● If one stop-light on a company car or truck fails, but the other functions, check your directional signal switch.

Sometimes the same lamp filament serves both as stop- and turn-light. In this case, directional switch is designed to open circuit to stop-light. This permits the light to flash on and off, even when the brake pedal is down.

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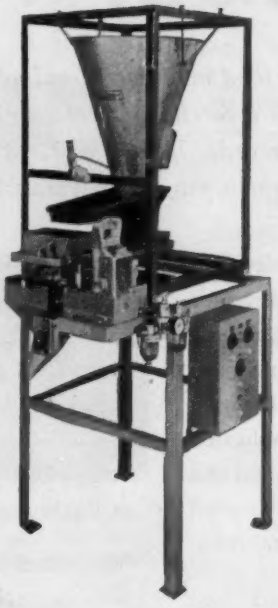
Send your idea today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.—The Editors.

Save production costs . . . eliminate overweights



Exact Weight® Weighing Machine offers these features:

- **Precision industrial-type scale.**
- **Over-under indicator visual check eliminates need for separate checkweighing operation.**
- **Calibrated adjustments with counterweights of known value, graduated beam; poise and scale indicator.**
- **Design backed by more than 40 years of experience in specialized weighing equipment.**
- **Readily accessible service and maintenance facilities.**
- **Performance guaranteed in writing.**

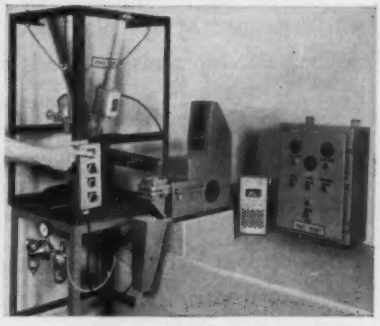
The Exact Weight Automatic Net Weighing Machine weighs and packages dry, free-flowing materials. Its fast and accurate operation speeds production . . . helps cut production costs.

It protects your profit margin by providing a constant and visible check on every package weight. Eliminates overweights.

Model 620 NW has a rated capacity of 10 lbs.; Model 610 NW has 3-lb. capacity. Write for Bulletin No. 3311.

Precision Automatic Net Weighing Machine

Model 4601 NW, right, for weighing dry products with accuracies of 1/10 gram on quantities below 10 grams and one percent accuracy on quantities of 10 grams and above. Combines a high-accuracy Shadograph Scale air-operated dump mechanism, hoppers, vibratory feeders and photoelectric controls. Models with capacities from 50 grams to 500 grams. Write for Bulletin No. 3363.



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For more data, circle 305 on Reader Service Card

Here's what Flo-Sweet

Today, with more and more food manufacturers looking for new ways to cut costs and improve quality, "Research & Development" activities are helping many companies set new records. Here is a status report on a number of Flo-Sweet R&D projects which may hold valuable information for you.

When you hear the words "research and development" you are likely to think of a Hollywood science fiction setting: laboratories crowded with gleaming glassware, white-smocked technicians peering earnestly into test tubes and microscopes, sensitive fingers manipulating the delicate controls of complicated instruments. Places like this really do exist; and one of them is the well equipped and competently staffed Flo-Sweet laboratory at our headquarters and refinery in Yonkers.

Why do we maintain such a comprehensive laboratory?

The answer is simple: to give *you,* the food manufacturer, new and better sugars to help you improve your products so that you can keep ahead of your competition.

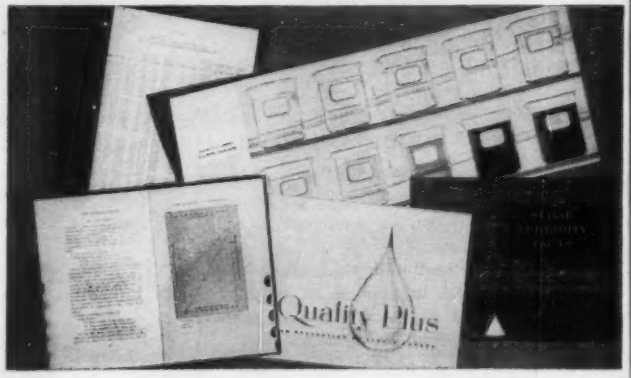
New Ideas Galore

From the very conception of the liquid sugar idea, which Refined Syrups pioneered, down to today's exciting developments in blends and Multi-Sugars, Flo-Sweet research and development have brought you a host of advances that have helped you cut your costs, increase your production, and improve your quality. For example:

Flo-Sweet was first to deliver liquid sugar on a bulk commercial basis, first to establish complete engineering service in design and installation of liquid sugar systems, first to formulate liquid sugars tailored to customer specifications. Flo-Sweet was first to develop food product quality control through use of liquid sugar, first to devise means of preventing surface dilution of liquid sugar in storage, first to develop effective means of controlling the temperature of liquid sugar going into production.

More recently, Flo-Sweet was first to come to grips with the problem of measuring turbidity, evaluating it, and controlling it to establish, in effect, new high standards of purity for the entire beverage industry. Flo-Sweet was first to conduct basic research into colors of sugar solutions and their correlations with refinery efficiency and resulting sugar purity. And Flo-Sweet was first in the entire sugar industry to publish an authoritative handbook on liquid sugar—

Flo-Sweet research has helped customers solve many problems. Factual reports, technical papers, illustrated brochures, and an authoritative handbook have been published to disseminate information as widely as possible.



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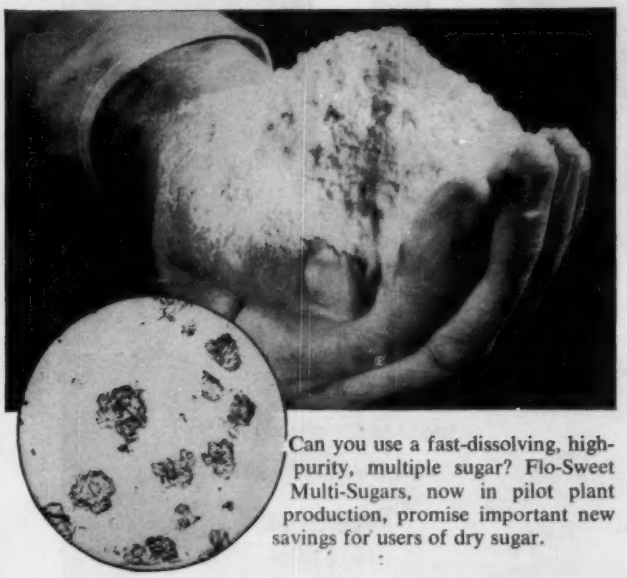

Can you use a fast-dissolving, high-purity, multiple sugar? Flo-Sweet Multi-Sugars, now in pilot plant production, promise important new savings for users of dry sugar.

making freely available, to customers and competitors alike, the factual results of thoroughgoing research painstakingly carried on through the years.

What Next?

In recent months, our customers in the metropolitan New York area have been enjoying the advantages of Flo-Sweet Sucrodex—a whole new family of sucrose-dextrose liquid sugars formulated to meet individual requirements. These Sucrodex sugars are Comogenized at our refinery to provide the utmost in uniformity. The enthusiastic reception that Sucrodex has received obviously suggests enlargement of the areas in which it is available.

As an adjunct to Sucrodex, plans are well under way for a line of companion products combining invert and dextrose sugars. We have kept this project "under wraps" for many months; and our research is now far enough along so that we can promise you rapid progress on this new group of sugars.

Possibly our most exciting research project hinges around our concept of Multi-Sugars—dry sugars consisting of different sugars interlocked in inseparable crystalline form. The Multi-Sugars so far developed are light, almost fluffy; are very fast dissolving; form clear, colorless solutions; make brilliant, white icings; and offer a number of other very attractive features. You will be hearing much more about Flo-Sweet Multi-Sugars!

Where You Fit In

All Flo-Sweet research, you will note, is directed toward helping *you*, the food product manufacturer. This research, our advertising, our own sales and sales engineering efforts are all directed toward *you*. This is to keep you well informed, to help you take full advantage of the many services we provide, to help you boost your own product quality and value to the utmost.

For the Flo-Sweet R&D laboratories are staffed not only with sugar experts, but with specialists in the many food industries as well. We are primarily food technologists – equipped and organized to handle *your* problems in food processing. In R&D as well as in production and sales, we have long followed the policy of serving industrial sugar users exclusively. In a word, this means serving *you*.

Frederic A. Davidson

Frederic A. Davidson
President

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Cooked-Potato Darkening

Discoloration of cooked potatoes occurs predominantly at the stem end, and is probably the result of iron-o-dihydroxyphenol complex formation.

Slices of cores 10 mm. in dia. were examined for blackening by reflectance measurements. And they were analyzed chemically for Fe, phenol chlorogenic acid groups, total phenols, citric acid, inorganic phosphate and pH.

Fe content was uniform over the whole length. Blackening was greatest at stem end where pH was 6.7-6.8, and followed the chlorogenic acid group concentration.

Toward the rose end, however, pH dropped to 6.5 and citrate concentration rose sharply. Under these conditions blackening fell off rapidly.

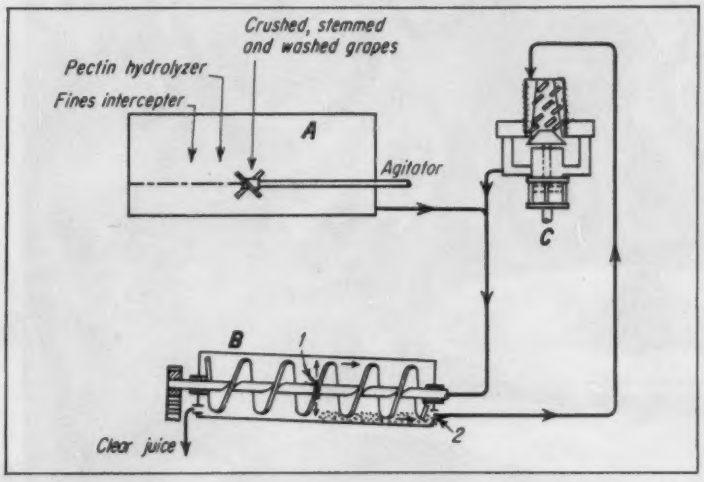
Distribution of blackening in individual potatoes appears to be due to two interacting factors: Competition of chlorogenic acid groups of phenols and citric acid for Fe. Intensity of blackening is also modified by pH changes and the amount of Fe available.—*Chem. & Ind.*, 627-28, May 1958.

Nonbitter Orangeade Base

Based on the fact that bitterness in navel orange juice can be controlled by reducing its pH, a process has been patented for production of an essentially nonbitter dehydrated orangeade, from this fruit.

Preferred embodiment of the discovery is concentration to 75-90% solids, mixing with sufficient sugar to produce a moist product, vacuum-drying to about 4% moisture and adding crystalline citric acid.

Product should be delivered to consumer in dry form and in packages of such size as to encourage prompt consumption of the reconstituted drink.—U.S. Patent 2,834,687, May 13, 1958.



Process Conditions Fruits and Berries Then Separates Juices From Pulp

Improvement in quality, and increased yield of juice from grapes and other fruits is claimed for a patented process in which the fruits are given a preliminary treatment with an enzyme and filter aid.

In the case of grapes, the washed, stemmed, and crushed fruit is heated to 100-130F. in agitator-equipped tank (A in drawing). To this mass is added 0.1-0.2% by weight of pectin hydrolyzing enzyme and 0.2-0.5% finely divided wood pulp fiber.

Enzyme disintegrates the cellular structure, releases juice, and forms pulpy debris. As the particles are formed they immediately become attached to the wood pulp filaments and form a net-like web.

After ½-1 hr., material is heated to 140-160F. to extract color, then pumped to continuous centrifugal extractor (B). This unit comprises a horizontal shell rotating at high speed, and screw mounted on a hollow shaft. It rotates in same direction as the shell but slightly slower.

Pulpy material is fed into hollow shaft of screw and discharges through ports (1). Pulp, etc. moves to periphery of shell while juice remains near center. Screw pushes the pulp to outlet (2) at end of cylinder. Juice discharges at other end.

Pulp containing about 65% liquid continues to vertical rotary press (C) where it is squeezed until practically dry. Separated juice passes through several screens, then is returned to extractor for final clarification.—U.S. Patent 2,837,431, June 3, 1958.

Determining Porosity Of Wrapping Papers

Paper used in high-speed wrapping of ¼-lb. chocolate bars can cause machine stoppages due to adhesion of wrappers to each other (too much ink), static electricity, warping, or variations in porosity that can cause the vacuum cups to pick up two at a time, or fail to pick up any at all.

In absence of special instruments used in the paper industry, comparative tests of porosity may be made by cutting disks of appropriate size from a candy wrapper and attaching them to a suction tube or funnel.

On applying a constant vacuum, pressure indication on a manometer between disk and vacuum source is a measure of paper's porosity.

A disk offering little or no resistance to passage of air is considered 100% porous. One permitting no passage would have zero porosity.

Poor operation begins with wrappers of 50% porosity. Here, suction pads occasionally pick up two wrap-

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Processing of Pre-Cooked Cereals —by permitting higher-solids processing without raising viscosity and thereby increasing plant output.

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pers at a time. At 65% porosity stoppages are frequent for this reason. Below 50% porosity there were no stoppages due to faulty wrappers.

Humidity and moisture uptake does not seem to affect porosity measurably. Fineness of fibers making up the paper is most important factor, but increasing fineness makes the paper sensitive to humidity and more prone to warping, while printing is liable to become more difficult.—*Int. Choc. Rev.*, 12(5), 198-217, 1958.

Irradiation Plus Mild Heating Effectively Sterilizes Foods

Combined irradiation-heat treatment is more effective than either treatment alone for sterilization of canned foods.

To test this theory, lean ground beef was packed in No. 1 picnic tins and inoculated with 1 ml. of a suspension of *Cl. botulinum* 213B spores (5,000,000 spores) at centers of cans. Cans were then irradiated with gamma rays from cobalt-60, followed by heat-processing in an autoclave for varying F_o values.

Sterilization was achieved with 130,000 megarep irradiation, followed by heat treatment with an F_o value of 0.2.

This indicated that it would be feasible to irradiate packaged raw foods at one location, then ship them under refrigeration to a second location for heat-processing. However, the combined treatment is *not* sufficient to sterilize canned foods containing putrefactive anaerobe 3679 spores. — *Applied Microbiology*, 6(4), 261-63, 1958.

Process Extends Shelf Life Of Dehydrated Foods

Deterioration of potato granules and other dehydrated granular food products can be prevented by deoxygenating the material before it is packaged. This is accomplished by washing with nitrogen gas in a patented continuous counterflow process.

Apparatus comprises a hopper from which granules are fed through a tubular elbow to a vertical pipe. They flow by gravity to a hopper at the bottom of the pipe where they are packaged.

Nitrogen is introduced near lower end of pipe through a perforated

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The foods you sell can show off much better, in beautiful glass by H-A. In crystal flint jars, nappys, or colorfully designed re-use tumblers—H-A uses beauty to pep up the power of package display. That's why H-A packaged foods appeal quicker to the eyes that buy.

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Exchange Pure California Lemon Juice

Lemon juice is nature's most effective anti-oxidant. It contains many organic reductants, including ascorbic acid and a rather broad group of phenolic anti-oxidants which fall under the classification of flavonoids, sulphydryl-like compounds and possibly flavonols, which act synergistically to give lemon juice its remarkable anti-oxidant properties. It discourages the growth of microorganisms, retards enzymatic action, prevents oxidative browning, reduces the pH of low acid foods and actually possesses the ability to enhance natural food flavor in many foods such as the natural peach flavor in freestone peaches. It is prepared by Sunkist Growers especially for industry use in baby foods, low acid fruits and vegetables, canned and frozen fruits, fruit juices and nectars, mayonnaise and salad dressings, sea foods in all forms, cured meats and wherever a problem of appearance or perishable flavor exists.

Exchange Citrus Pectin— Slow Set and Rapid Set

There is one tailored to your special need. They are used by more American preservers, confectioners, and food processors than all other brands *combined*. Guaranteed by Sunkist.*

Exchange Low Methoxyl Pectin— Pectin L. M.

The *only* pectin that forms a true jell without sugar. It is the exclusive choice for aspics, jellied fruit and vegetable salads, low calorie jams, and dietetic fruit jells. Guaranteed by Sunkist.*

Exchange Pure California Orange Juice

Gives your product more of the true fruit characteristics—because it is made from California oranges, known for their richer content of ascorbic acid, amino acids, polysaccharide complexes, B complex factors, carotene (pro-vitamin A), and aromatic flavor compounds. Prepared especially for the food and beverage industry. Guaranteed by Sunkist.*

Exchange Frozen Lemon Puree and Exchange Frozen Orange Puree

Both purees of whole lemons and oranges (seeds removed) are standardized in juice acidity, sugar content and flavor. Purees give a like-fresh tangy taste to food recipes and beverage formulas. Guaranteed by Sunkist.*

Exchange Lemon Oil, U. S. P.— California Cold Pressed

Because of its clarity, uniformity and flavor intensity, it is the 10 to 1 choice over all other lemon oils sold in America. Never needs pre-testing when received in EXCHANGE-sealed containers. Guaranteed by Sunkist.*

Exchange Orange Oil, U. S. P.— California Cold Pressed

For true aromatic flavor, full color intensity and pure California flavor strength, EXCHANGE brand is the orange oil standard of the world. Guaranteed by Sunkist.*

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EXCHANGE brand citrus products are produced and guaranteed by Sunkist Growers, Inc., representing the world's largest supplies of lemons and rich California oranges.

Every EXCHANGE brand product is made in our own ultramodern plants to the highest standards of purity, quality and uniformity.

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head that acts as a diffuser. It rises in counterflow to the granules, flushing the air and oxygen from them.

Vertical pipe is composed of alternately constricted and expanded sections of Pyrex glass. Rising gas causes fluidization of the granules in the constricted areas, while a smooth steady flow is maintained through the expanded areas.—U.S. Patent 2,830,911, Apr. 15, 1958.

Wine Fermentation Speeded By Addition of Nitrogen

Wine fermentations are not accelerated appreciably by any substances other than nitrogenous materials.

Most effective of these are ammonium salts, urea, asparagine, casein hydrolyzate, and yeast extract. Fermentation velocity in g. CO_2 per day increased as N_2 content of must was increased, but alcohol yield was lessened at the higher N_2 levels.

Yeast crops (lees) were increased by N_2 additions. One of the best accelerators was dried white wine lees. Urea additions increased the daily CO_2 output, alcohol production and yeast growth, in proportion to the logarithm of the N_2 content of the must.—*Revue des Fermentations et Des Industries Alimentaires* 13(2), 59-71, 1958. (In English).

Solubilizing Milk Proteins

Substantially the entire protein of milk—casein, lactalbumin, and lactoglobulin—can be converted into a form that is totally dispersible or soluble in aqueous solution.

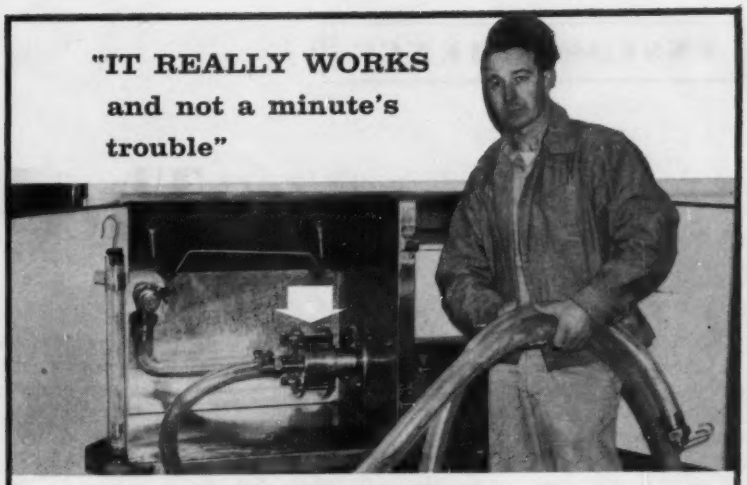
According to a patented process, proteins are precipitated from skim milk, separated from the whey, washed, and centrifuged or pressed.

As an example, pH of curd is adjusted from the original 5.8 to 6.6 with KOH, and further increased to 8.3 with NH_4OH.

When spray-dried, the NH_4OH is dissipated, and pH of product returns to 6.6.–U.S. Patent 2,832,685, Apr. 29, 1958.

Dairy Courses: U. of Md.–Dairy Tech Conference, Nov. 12; Montana State–Dairy Mfg. course, Nov. 17-19; Penn State–Soft Ice Cream, Dec. 1-5; Texas Tech.–Dairy Ind. course, Nov. 10-12.

"IT REALLY WORKS and not a minute's trouble"



These are the words of Orville Blaschke, contract milk carrier, after using the Viking "Sanitor" 7171A pump, shown here.

You, too, can have these advantages . . . fast pumping; easy, quick cleaning; trouble-free service . . . when you specify Viking 3A-approved "Sanitor" pumps for all your milk handling.

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The Vital Story

A Puzzling Medical Case. A sick, fretful baby lay on his back in a hospital crib recently, his legs extended and his knees slightly bent. He cried and tried to draw away from the examining physician. The doctor studied the case carefully, noting the symptoms and investigating the history of the little patient. Then he made his diagnosis. The baby had *scurvy*.

An Ancient Disease. To us scurvy is a remote disease. We know that years ago it attacked sailors and explorers living on monotonous diets of salt meat and hardtack. But it's hard to believe that scurvy occurs even today in the United States. To be sure, there are few cases, but there should be none! Scurvy is a disease resulting from a deficiency in the diet; it is simply the lack of enough vitamin C.

Scurvy was a disease of the Crusades. It traveled with Vasco de Gama around the Cape of Good Hope, killing two-thirds of his crew. It struck down a quarter of Cartier's men wintering in Canada in 1535. It occurred in famines and pestilences.

Vitamin C Isolated. Long before vitamin C was known, man found certain fruits and vegetables helpful in preventing and treating scurvy. These had been a remedy for scurvy for about 300 years when, in the first quarter of the Twentieth Century, researchers began to examine foods to discover the factor which made them antiscorbutic.

Between 1918 and 1925, Zilva concentrated this antiscorbutic substance from lemons and Agopian isolated it in cabbage.

Zilva's work established the important properties of the vitamin, its molecular construction, and its activity as a "reducing factor" — its ability to absorb oxygen. In 1928 Szent-Györgyi, after eight years of investigation, isolated a strong reducing compound from adrenal glands, oranges and cabbage, which he called "hexuronic acid."

In 1931 C. G. King established the chemical structure of vitamin C, thus opening the way to new and important findings. The following year various investigators identified the "reducing factor," "hexuronic acid" and vitamin C as the same compound.

Nature's Vitamin Duplicated. Soon after the vitamin had been isolated and its chemical structure understood, it was synthesized by Reichstein and his fellow workers in Switzerland. Almost simultaneously in Great Britain, Haworth and his associates achieved the same results. The year was 1933.

The synthesis of vitamin C led to pilot plant and then to commercial production, making it available at lower costs than if it had been extracted from natural sources. In fact, the Reichstein synthesis is the basis for weekly production *by the tons* by the firm of Hoffmann-La Roche, the world's largest producer of vitamin C. This commercial production of vitamin C has had incalculable value to the health of people all over the world.

To The Moon And Back. In the United States today, the average *weekly* production of man-made vitamin C now approaches 40 tons — the amount contained in approximately three-quarters of a billion average oranges.

A graphic way to illustrate the huge annual production is to show the equivalent in oranges. Laid side by side, these oranges would reach over two million miles, or more than four round trips to the moon. The *weekly* production alone, expressed as oranges, would circle the world at the equator over one and one-half times.

Synthesis on such a gigantic scale has led to economical costs. Because of this and its proven value to health, vitamin C has an increasingly widespread use in food and pharmaceutical products. There is no substitute for Vitamin C!

A Little Goes A Long Way. One kilogram (2.2 pounds) of pure vitamin C will supply 13,333 people for one day with the amount recommended (75 milligrams) for daily intake by the National Research Council. Or it will supply 92 people for one year with the adult Minimum Daily Requirement (30 milligrams) set by the U. S. Food and Drug Administration.

Names. The designation, vitamin C, is used interchangeably with ascorbic acid. "Ascorbic" is a relatively new word in our language. It was devised by Szent-Györgyi and Haworth in 1933 from **a**n**t**i**s**c**o**r**b**u**t**i**c**.

Among chemists and nutritionists, vitamin C is known as *l*-ascorbic acid. The formula is $C_6H_8O_6$, which means that it is composed of carbon, hydrogen, and oxygen.

Physical Characteristics. *l*-Ascorbic acid is a white crystalline compound with a slightly acidic taste. It is readily soluble in water, alcohol, glycerin and propylene glycol, and insoluble in oils, fats, ether, benzene or chloroform.

Since it is able to "attach" itself to oxygen it is one of our most important antioxidants for certain foods that have a tendency to discolor and lose their natural flavor.

The designation "U. S. P." used with *l*-ascorbic acid indicates that the product conforms to the stringent specifications of the United States Pharmacopeia. These initials stand for top quality.

Vitamin C made by the Roche process is chemically and biologically identical with nature's own product.

How Vitamin C Helps Our Health. Vitamin C is a vital substance; we cannot live without it. Not only does it prevent or cure scurvy, but it is essential for maintaining healthy bone tissue, and for forming collagen, an important protein found in our skin, tendons, bones, cartilage and connective tissue. Vitamin C is needed for the healthy functioning of the vessels

Expanded Version

# of VITAMIN C *by* Science Writer

(*l*-Ascorbic Acid)

through which our body fluids flow. It also promotes healing of wounds and fractures. It is believed to be essential for tissue respiration, the continual action of the cells as they burn food materials to provide heat and energy for the body.

Our Daily Requirements. Even though ascorbic acid is found in all body tissues and fluids, it will be rapidly exhausted if we do not replenish our supplies each day.

The Food and Drug Administration of the U. S. Department of Health, Education and Welfare has established a *Minimum Daily Requirement* for adults of 30 milligrams. This is just enough to prevent recognizable signs of vitamin C deficiency.

The Food and Nutrition Board of the National Research Council has issued *Recommended Daily Dietary Allowances* for vitamin C which are well above the F. & D. A. minimum.

Recommendations for Daily Vitamin C Intake

Ascorbic Acid (milligrams)

Men, all ages	75	Children, age 4-6	50
Women, all ages	70	Children, age 7-9	60
Women, pregnant (3rd trimester)	100	Children, age 10-12	75
Women, lactating	150	Boys, age 13-15	90
Infants, to one year	30	Boys, age 16-19	100
Children, age 1-3	35	Girls, age 13-15	80
		Girls, age 16-19	80

Use in Medicine. For some conditions, ascorbic acid is a necessity; for others, it is a help in restoring the body to normal. It is obvious that vitamin C is the cure for scurvy. Medical science has also found it to be helpful in the treatment of burns, in the repair of fractures, in high fever, in shock, in surgery and in exposure to extreme temperatures.

Of special importance is the use of ascorbic acid by pregnant and lactating patients. The physician must see that the infant receives his share of the essential vitamin, and that the mother's supply is not depleted.

Pharmaceutical manufacturers prepare many forms and potencies of vitamin C for the physician to prescribe.

Which Foods Are Best? Vitamin C is present in many foods. Citrus fruits — oranges, lemons, grapefruit, etc. — are generally good sources. Other fruit, certain green vegetables, tomatoes and potatoes are also sources of the vitamin. There are wide differences, however, between foods and even between varieties of the same food. The differences among commercially canned juices are graphically shown in the following table compiled by the U. S. Department of Agriculture:

Juice	Minimum	Maximum
	mg. ascorbic acid/100 mg. juice	
Apple	0.2	3.6
Grape	0	4.7
Grapefruit	10.0	49.0
Orange	9.7	70.0
Pineapple	5.4	18.0
Tomato	2.5	32.0

A Public Health Problem. It's an ironic situation that Americans, who have a plentiful and varied diet available to them, have been found by responsible researchers to have subclinical and recognizable vitamin C deficiencies.

The public relies on processed juices to supply a large part of its daily vitamin C requirement. All unknowing, it often fails to receive even a token amount because of the variations shown.

For these reasons — *widespread deficiencies and inadequate intake* — it is desirable to standardize the vitamin C content of processed fruit and vegetable juices at levels which will guarantee a significant amount of the vitamin per each serving of juice. Diet experts believe that such standardization is in the public interest. It may be achieved by the simple addition of pure, crystalline vitamin C. The Canadian government has recognized the value of this idea and has set a standard which all "vitaminized" apple juice must meet.

Saved: Natural Color and Flavor. Many delicious fruits which are quick frozen lose their natural color and delicate flavor during thawing. By adding pure *l*-ascorbic acid to these before freezing, processors can protect the natural color and flavor during thawing and for some time after. The ascorbic acid acts as an antioxidant; it "takes up" the oxygen in the air before that oxygen can trigger the reactions which cause the undesirable changes.

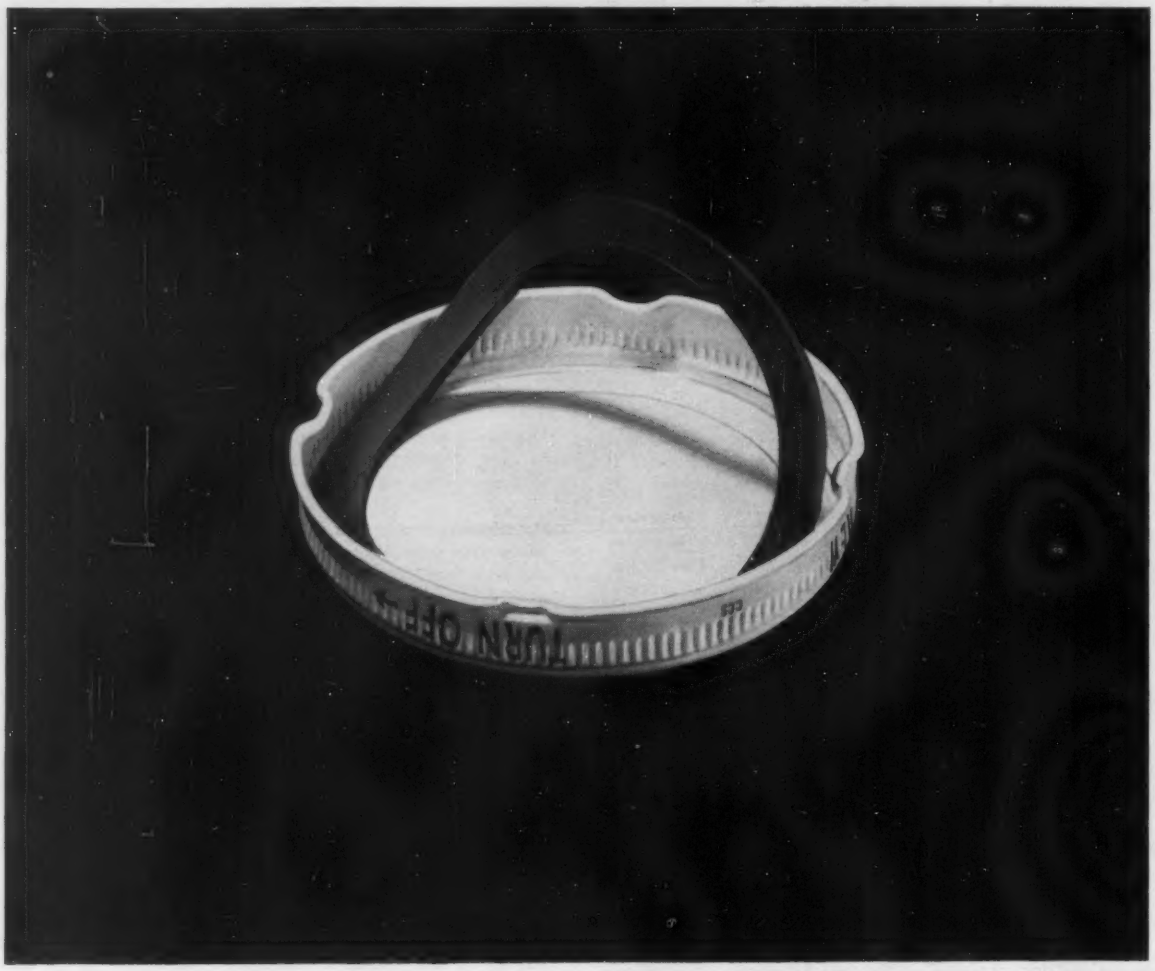
Vitamin C has been used for more than 15 years as the preferred antioxidant in frozen peaches, apricots, apples, berries, bananas, pears, pineapple, fruit purees and fruit cocktail. It has been used also in canned fruit and fruit juices, sauerkraut, pickles, beer, cured meats, milk, and mushrooms.

Homemakers seeking variety in the fruit and fruit juices served to their families will be influenced to buy the product to which sufficient *l*-ascorbic acid has been added to allow a label claim. When a nutritive claim is made for a food, a declaration must appear on the label. One form reads:

> *"One four-ounce portion provides 100% of the minimum daily adult requirement of vitamin C."*

Processors using the twin benefits of *l*-ascorbic acid — nutritive value and antioxidant effect — are delivering more attractive, more palatable, more popular, and more valuable foods.

Yours For the Asking. Summarizing our present knowledge of this vitamin, this article is one of a series published by the Vitamin Division of Hoffmann-La Roche Inc. Reprints of this, and all others in the series, are available without charge. Reasonable quantities will be available to those in education who wish to use the material in their teaching. Send your request to Vitamin Division, Hoffmann-La Roche Inc., Roche Park, Nutley 10, New Jersey; in Canada to Hoffmann-La Roche Ltd., 1956 Bourdon Street, St. Laurent, Montreal 9, P.Q.



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Kathabar® systems kill micro-organisms and hold rooms at specific low bacteria and mold levels!

Because bacteria are killed by the chemical absorbent in a Kathabar system, it was long suspected that air passed through this system should be relatively free of bacteria. Proof of this theory would be of vital importance wherever airborne organisms contaminate humans or products.

To check this hunch, Surface asked a university research staff to conduct a series of exhaustive tests.

research proof

The conclusion of the research staff is that 97% of all micro-organisms (both pathogenic and non-pathogenic) are removed from air which passes through a standard Kathabar unit.

More tests are being continued in several industries with varying conditions. Current research results indicate that air purification—long desired by many industries and institutions—can be as feasible and simple as purification of drinking water.

what does it mean?

The system's advantages for hospitals show the significance of these findings. It provides the first continuous source of pure air. A Kathabar system will deliver to operating rooms air with not to exceed 5 organisms per 10 cubic feet (measured by the All-Glass Impinger method); provided the air supply contains 100 or less organisms per 10 cubic feet. This will maintain an operating room, with normal occupancy, at 10 organisms or less per 10 cubic feet—1/10 the normal level found by actual readings in hospitals.

The liquid sorbent is not affected by the organisms it kills. It is equally effective with any volume of air you require for your space or process.

The system also provides practical, year-round humidity control. It will humidify in the winter; dehumidify in the summer.

When possible it permits recirculation of air for operating, delivery, cystoscopic, and fracture rooms. Eliminating the need for all fresh air reduces both the first cost and operating cost of a Kathabar air conditioning system.

benefits for other industries

Hospitals, of course, are not alone in their need for continuous pure air. Direct and immediate benefits can be realized in other fields, too, such as foods, pharmaceuticals, beverages, clinics, laboratories, and public buildings.

Even where pure air is not a primary factor, it is an important added benefit. Examples are drying operations, storage, testing, comfort applications.

who uses Kathabar systems

Kathabar systems make profits out of air for these industries:

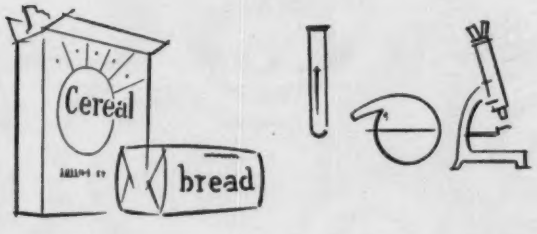
Atomic Energy	Machining
Breweries	Matches
Cake Mix	Marine
Candy	Meat
Cellophane	Offices
Cellulose	Ordnance
Cereals	Paper
Chemicals	Pharmaceuticals
Coffee	Plastics
Comfort	Printing
Compressors	Rockets
Cookies	Rubber
Electronics	Shellac
Explosives	Sugar
Film	Sanitaryware
Foundries	Testing
Gelatin	Textiles
Glass	Transformers
Glue	Transistors
Gum	Vacuum Tubes
Hospitals	Varnish
Hotels	Waterworks
Lacquer	Wire
Lenses	Yeast

how they use Kathabar systems

Many of these industries are now discovering the benefits of air sterilization by Kathabar systems. Others use them to (1) maintain spaces at 80 F and 55% RH or lower; (2) obtain continuous air at sub-freezing dry bulbs and dew points; (3) eliminate condensation: and (4) improve drying processes.

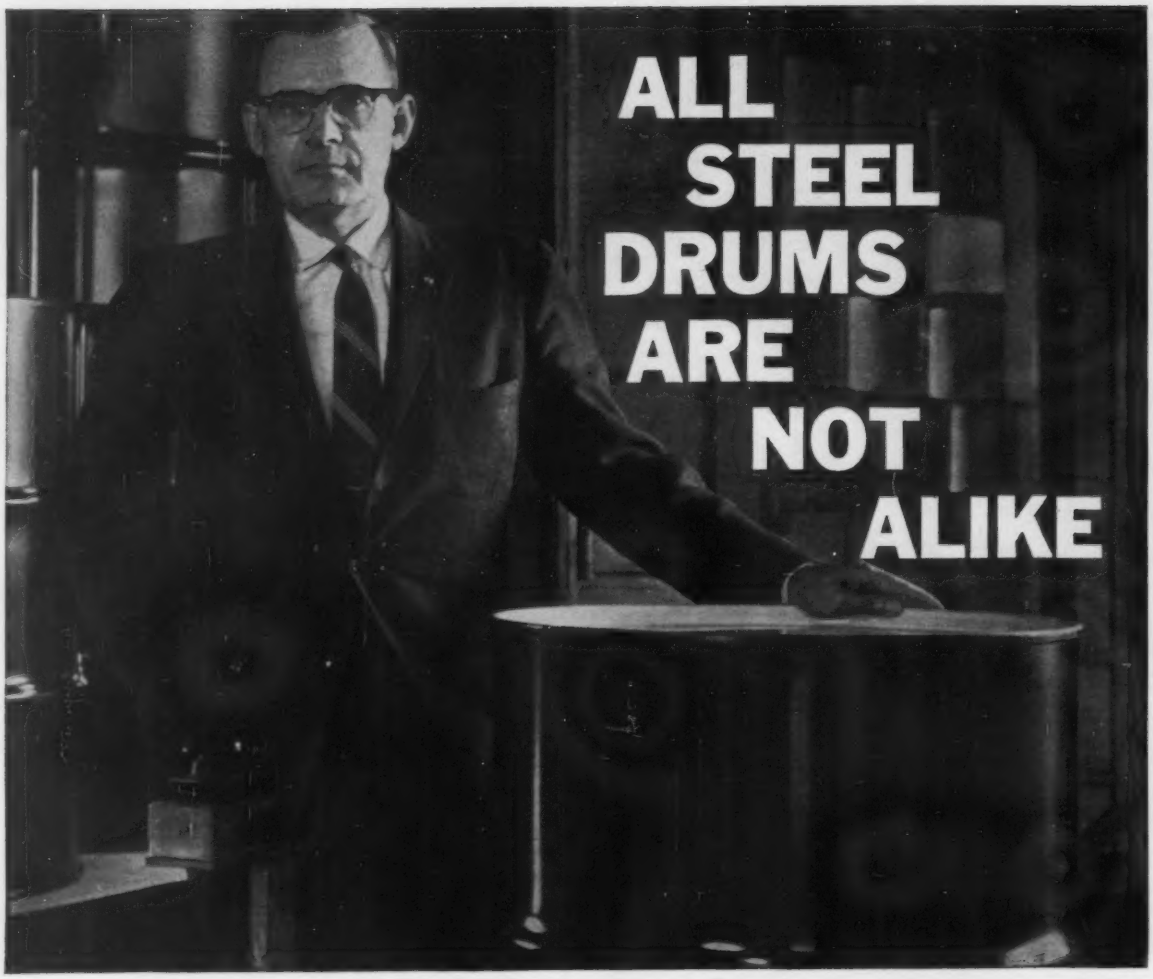
send description of your problem

Air Conditioning and Drying Division
SURFACE COMBUSTION CORPORATION
2382 Dorr Street Toledo 1, Ohio



Kathabar systems by Surface

For more data, circle 315 on Reader Service Card



Now get two important purchasing advantages and positive product protection, too, with U. S. Steel rust-inhibited drums

In a rust-inhibited drum you can't buy better quality than U. S. Steel.

Every shell, head and bottom is precisely formed, chemically cleaned, then coated with just the right amount of zinc phosphate. At U. S. Steel, all this work is done before final assembly, to give maximum product protection.

And every pail and drum comes with two purchasing advantages to help you save time and money:

1. Full, complete line. U. S. Steel offers today's widest selection of steel shipping containers. Sturdy pails from 2½ through 12 gallons. Drums through 57 gallons. Linings and closures supplied to your specifications—color-decorating to meet all your requirements.

You get the container with exactly the right properties for your products, in the most efficient size. And you deal with one dependable manufacturer.

2. Punctual deliveries. With factories in seven key areas, U. S. Steel container deliveries can be timed to your production schedules. You minimize inventory problems, get on-time delivery. And you can take delivery by rail or truck, whichever is more convenient.

So talk over your own container needs with the man from U. S. Steel and benefit from over 40 years of steel shipping-container experience.

Factories in: Los Angeles, Calif. · Alameda, Calif. · Port Arthur, Texas · Chicago, Ill. · New Orleans, La. · Sharon, Pa. · Camden, N. J.

United States Steel Products Division

USS TRADEMARK

DO YOU NEED THE LASTING PROTECTION OF USS STAINLESS STEEL CONTAINERS?

For some products, stainless-steel containers can be the least expensive of all. Learn if you can save money with a U. S. S. stainless container. Consult your U. S. Steel representative, or write for free brochure. U. S. Steel Products Division, 30 Rockefeller Plaza, New York 20, N. Y.

MEN & COMPANIES

Theodore Rosenak (left) and Rocco B. Bunino

Beer Talent . . . How warily must the beer advertiser proceed?

"Many appeals suitable to other advertising are objectionable in beer advertising," Theodore Rosenak notes bluntly.

Since 1951, Mr. Rosenak has been advertising v.-p. for Blatz Brewing Co., now a separately operated division of Pabst.

He and his team-mate, V.-P. Rocco B. Bunino, Blatz sales director, have just added v.-p. hats from Pabst Brewing Co. to those they hold from Blatz.

Pitfalls for the beer advertiser, according to Mr. Rosenak, may lie in the differences among city, county, and state legal requirements, and almost equally in public attitudes.

From his cub copywriter days with J. R. Hamilton ad agency, Mr. Rosenak's entire advertising career has been associated with beer. In 1930, he was the account executive for Pabst's Puritan Malt extract.

Mr. Bunino was once a beer retailer. He was the first two-term president of National Licensed Beverage Assn., and during the war served on the Alcohol Beverages Industry Committee for OPS.

Edwin T. Gibson

Food 'Savvy' . . . For its new board chairman, Market Research Corp. of America has tapped the food industry. It has picked a man who guided the now giant business of frozen foods through some of its first, faltering "baby" steps.

Edwin T. Gibson was formerly executive v.-p. and director of General Foods Corp.

Food men will recall that GF acquired the Birdseye process during the '30s.

"From the germ of an idea," says Clarence Francis, former GF chairman, "Mr. Gibson was mainly responsible for the development of a new and untried process—a dream—into a thriving successful industry."

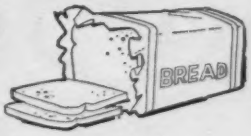
New v.-p.'s at Curtiss Candy Co. (left to right): Les Kellough, general sales manager; William E. Hunter, head of newly-created purchasing div.; and William McFarland, secretary.

TAKAMINE ENZYMES

WORK FOR YOU ECONOMICALLY!

If your business is processing foods containing starches, proteins, pectins or glucose, chances are that you can produce a superior product more economically by using these specific TAKAMINE catalysts:

PROTEINASES



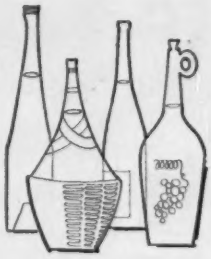
For the modification and hydrolysis of proteins in food and pharmaceutical manufacturing.

GLUCOSE-OXIDASE

Prevent browning due to glucose or oxygen or container corrosion, assuring longer shelf-life!

DIASTASES

For liquifaction and hydrolysis of starch to produce soluble dextrins and sugars, or to remove starch causing filtration problems.



PECTIC ENZYMES

For the hydrolysis of pectins in fruit and fruit juices to speed processing and to make fruit juices sparkling clear.

SODIUM ISOASCORBATE AND ISOASCORBIC ACID

are available in bulk or handy tablet form for protection of frozen fruits, vegetables, beer, carbonated beverages, meats and fish.

FOODS *Look* better . . . *Taste* better . . . *Sell* better with TAKAMINE products.

Write TAKAMINE Research Center for complete information on the use of enzymes in your particular operation:

TAKAMINE LABORATORY

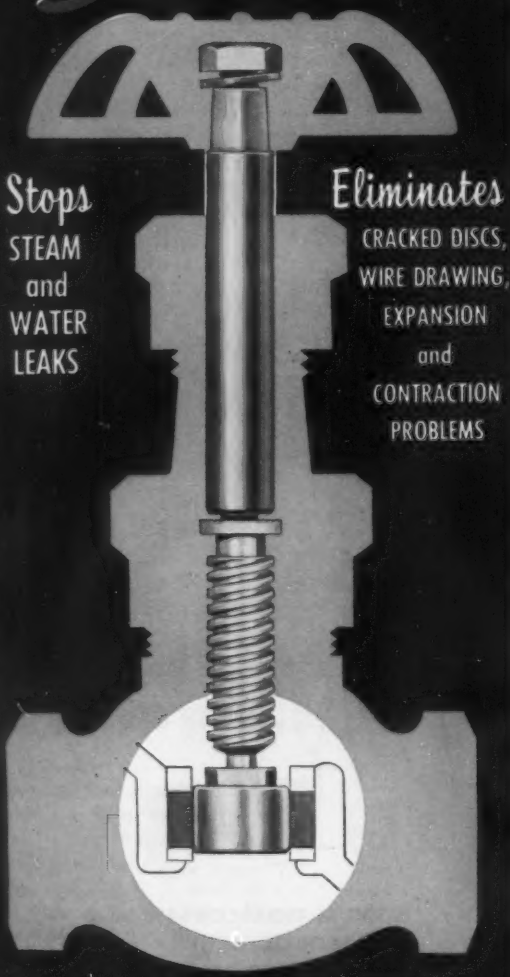
DIVISION OF MILES LABORATORIES, INC.
CLIFTON, NEW JERSEY

For more data, circle 317 on Reader Service Card

Dairymen!

Here is a Valve Designed Exclusively for YOU!

by Strahman



Stops STEAM and WATER LEAKS

Eliminates CRACKED DISCS, WIRE DRAWING, EXPANSION and CONTRACTION PROBLEMS

A resilient sealing ring and stainless steel piston replace the metal seat or disc found in the conventional valve, the cause of most valve troubles. The Strahman Valve seals itself as a cork seals a bottle. In throttling, the erosive action of the elements passing through the valve cannot have any effect on the sealing surfaces.

Strahman Steam and Water Valves are made of Bronze construction, with Stainless Steel Stem and Piston, assuring long life.

Write direct for complete catalogue

STRAHMAN VALVES, INC.,
16 HUDSON STREET, NEW YORK 13, U.S.A.

Permanent Job . . . National Can Corp. hired a consultant a few months ago. It will keep him as president and chief executive officer.

J. B. Wharton, Jr., 44, takes over from Robert S. Solinsky, 64, who becomes board chairman. Donald C. Lillis has held latter post. He will continue as chairman of executive committee.

His principal job, as Mr. Wharton sees it, is "long range policy." Recent moves of National Can have been to delegate responsibility to operating level, and tighten sales and production coordination.

J. B. Wharton, Jr.

Mr. Wharton is chairman of Maryland Biscuit Co.

Karl A. Mohr

Progress in Sanitation . . . "Sanitarian of the year" is Karl A. Mohr.

The '58 selectee of International Assn. of Milk & Food Sanitarians, at its recent annual meeting in New York City, is chief sanitarian and deputy health commissioner of Green Bay, Wis.

Basis for Mr. Mohr's recognition was "5 years' meritorious contribution to health and welfare of his community."

Among other activities, he spearheaded formation of the Wis. Conference on Intrastate Milk Shipments in '55, and is permanent chairman. He began a new meat inspection program, and is working to develop an intrastate conference on meat similar to the one on milk.

New officer lineup for IAMFS has Franklin W. Barber, of National Dairy Research Laboratories, in the presidential post. First V.-P. Wm. V. Hickey moves up to president-elect, and Prof. John J. Sheuring, U. of Ga., goes from 2nd to 1st v.-p.

Richard R. Deupree, board chairman of Procter & Gamble Co., is recipient of 1958 Henry Laurence Gantt Gold Medal for "distinguished achievement in industrial management." Award was presented recently under joint auspices of American Management Assn. and American Society of Mechanical Engineers.

Thomas E. Krug is new v.-p. of National Biscuit Co.'s bread division.

William T. Miller has replaced Nehi Corp.'s retiring production v.-p., **R. N. Kamm.**

Harold W. Souther, v.-p. and director of Libby, McNeill & Libby, has retired after 40 yr.

Frederic T. Tansill has been upped to executive v.-p. of Chock Full O' Nuts.

Ed Walzer will fill newly created post of director of communications for National Consumer Panel division of Market Research Corp. of America.

Industry

Armour & Co. has closed its Roxbury, Mass., plant, and transferred operations to the plant of its Chamberlain & Co. div. in Boston.

Arnold Bakers, Inc., plans new $2 million plant at Greenwich, Conn.

Beatrice Foods Co. and **Squire Dingee Co.,** Chicago, jointly announce their merger.

General Foods Corp. ranked first among food companies, and fourth in the nation, in amount spent for advertising in '57, with an estimated $87

Modernize your method of Handling Baked Goods . . .

Baked goods are loaded into Nestaway Racks from top or end at wrapping machine.

Racks are moved on caster bases to order make-up. Stacks of racks are broken down; reassembled into orders.

Filled Racks are loaded on trucks for delivery to stores and distribution points. Racks roll easy; fit snugly in trucks.

Filled Racks are left in store for customer consumption. Products attractively displayed in racks and are easily accessible.

On door-to-door routes, salesman loads carrier right from filled racks. When empty, racks are nested by salesman.

Nestaway racks are wheeled into freezer from wrapper. Open construction permits rapid freezing; defrosting.

. . . from Wrapper to Consumer

NESTAWAY

is the only

Nestaway Racks nest almost 100%. Nested racks can be stored in out-of-way places; saving up to 78% floor space.

COMPLETE BAKED GOODS HANDLING SYSTEM!

There's only one modern, efficient way to handle bread and baked goods and that's with the Nestaway System. Only Nestaway offers you an engineered handling system designed specifically to meet your bakery's requirements.

Nestaway with its wire shipping racks, rack dividers—which double rack capacity—and castered bases enables you to load bread and baked goods at the wrapper and move them all the way to the consumer without any rehandling of your products. No other handling system protects baked goods like Nestaway. Your products reach the customer just as they left the wrapper. And, with the Nestaway System you can merchandise your products right in the store without transferring them to display stands.

In freezing operations, order make-up, door-to-door deliveries and in-store use, Nestaway provides a flow of motion you'll find with no other system. Nothing saves space like Nestaway. You can store 56 empty racks in the same space 12 full ones require. Think of it! You save up to 78% in valuable storage space.

Whether your operation is retail, wholesale or both, the Nestaway System will save you time, space and money and make your operation more efficient than it's ever been.

Write for **FREE** Brochure

"Engineered Material Handling Systems"

NESTAWAY INC.

2108 PAYNE AVE., CLEVELAND 14, OHIO

million. U. S. top 100 adver- Sperti Products, Inc., and

New Invention Cuts Waste Disposal Costs By Two-Thirds in Food Processing Plants

Industry Cost Averages May Be Lowered Soon

If your plant is average, you're probably spending between .55 and .85 cents for every cubic yard of waste or trash moved to the disposal area . . . not including truck operation costs.

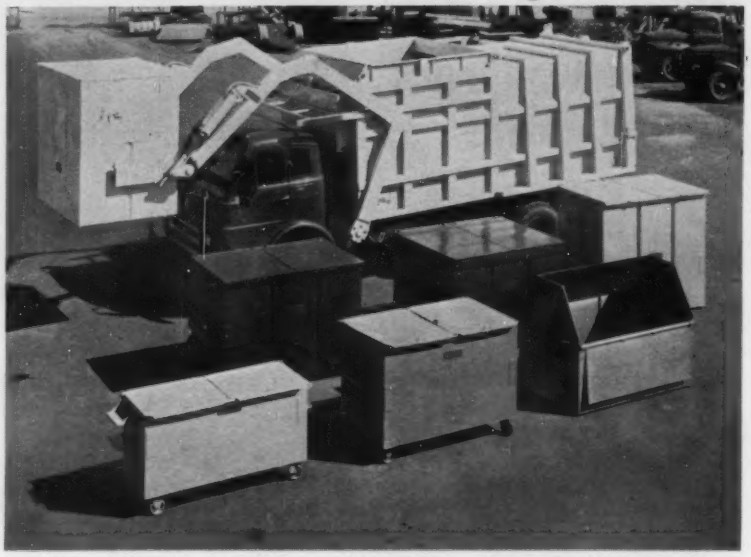
A recent development, the DEMPSTER-DUMPMASTER self-loading packer, promises to cut direct disposal costs to a new industry low of .07 to .16 cents per cubic yard for volume producers.

This new approach is an extension of the widely-established DEMPSTER-DUMPSTER System, in that it employs detachable waste storage containers. However, instead of carrying each container to the disposal area for dumping, the new machine empties many containers into its body, where the material is compacted to a fraction of its former volume. This permits per-trip payloads of 50 to 100 cubic yards of loose material, depending on its characteristics.

Multiple exposure photo shows dumping of 6 cu. yd. container.

How it Operates

The one-man Dumpmaster makes its rounds from container to container. Approaching, the driver engages lifting channels on the container's sides with the clearance arms. From controls in the cab, or remote controls at the front bumper, the container is lifted and rotated, discharging waste into the packer body. The material is hydraulically compacted while enroute to the next location. Containers may also be handled from docks or below grade. The safety clearance arms never pass the cab windows, eliminating possibility of driver injury.



The newly developed DEMPSTER-DUMPMASTER is shown with the seven basic containers it serves. Being hoisted is a 6 cu. yd. model. On ground are 1, 2, 3, 4 and 5 cu. yd. designs. Open container is used for hand-loading service.

New "Tracking" Caster Developments Make Plant "Container Trains" Practical

To whip the high cost of moving refuse outside, many plants are going to "container trains." Using special casters and couplers, eight to ten containers are towed by "plant mules" to inside generation points where an empty is dropped off and the full one is coupled on. Outside, the containers are uncoupled and automatically emptied by the waiting DUMPMASTER.

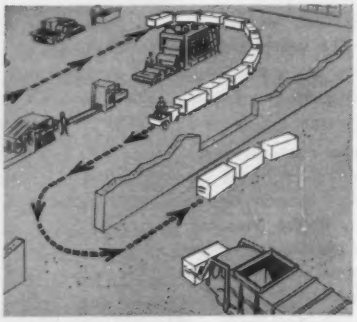


Diagram shows containers, in train, being hauled outside for emptying.

* * *

Many Designs Available

Standard and special-purpose containers, ranging from one through six cubic yard capacity, with or without casters, are available. The two cubic yard container above holds the equivalent of over 12 30-gallon trash cans.

Cost-Finding Book Offered

Write for the free 40-page book, "How to Cut Waste Disposal Costs," offered by the manufacturer. It contains cost-finding formulas, solutions to problems, case histories, industry average costs, etc. Equipment demonstrations arranged on request.

Mfd. by Dempster Brothers, Inc.

DEMPSTER BROTHERS

KNOXVILLE, TENN., DEPT. FE-10

million. U. S. top 100 advertisers included 21 food companies.

Glidden Co. will construct $2 million plant to product synthetic levo-menthol. Unit will be part of firm's Jacksonville, Fla., operations.

Kelly Douglas & Co., Ltd. is erecting a new $2 million manufacturing plant at Lake City Industrial Park in Burnaby, B. C.

H. W. Lay & Co., Inc., Atlanta, will build a $400,000 manufacturing and distribution plant in Greensboro, N. C.

Nalley's Ltd. has completed the quarter-million dollar expansion of its Vancouver, B. C., plant.

Pepsi-Cola Bottling Co., L. A., has acquired franchise and plant facilities of Hires in the Los Angeles-Glendale area.

Pet Milk Co. is transferring headquarters of its Pet-Ritz Div. from Beulah, Mich., to St. Louis. New gen. mgr. of the division will be Wm. N. Harsha, formerly managing director of Pet's Canadian operation.

Sperti Products, Inc., and the **Institutum Divi Thomae Foundation** of Hoboken, N. J., have filed a million dollar damage suit against Golden Gift, Inc., of Clermont, Fla. Action alleges violation of agreements covering citrus juice processing patents.

Associated Industries

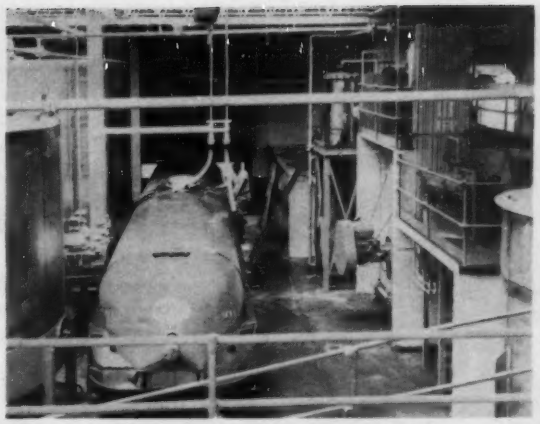
Babcock & Wilcox will get permit to build a low-power reactor near Lynchburg, Va., according to statement by A.E.C.

Chisholm-Ryder Co. has acquired International Filling Machine Corp., Petersburg, Va.

Daystrom, Inc., has purchased Industrial Gauges Corp., West Englewood, N. J.

Dodge & Olcott, Inc., New York City, is celebrating its 160th anniversary.

Nuclear Science & Engineering Corp. has expanded its neutron dosimetry services, which now include supplying of standard and custom dosimeters and complete post-irradiation analysis.



Tank truck loading at National Sugar Refining Co.'s new plant and distribution center in St. Bernard (Greater Cincinnati), Ohio. Facilities are also available to provide service for rail tank cars.

Nuclear Development Corp. of America has moved its r&d operations into new 63-acre center in Westchester County. Firm, which began business 10 yr. ago with 3 employees, now occupies 3 major facilities. Other two are headquarters in White Plains, and 1,200-acre experimental station near Pawling, N. Y.

Deaths

Charles Doughty Allen, 79, retired v.-p. of H. Kohnstamm & Co., Inc., New York City.

Gustave T. Reich, 67, consultant, formerly technical director of Pennsylvania Sugar Co., Philadelphia (see FE, Feb. '58).

NOW . . .

MULTIPLE PACKETER **MODEL II**

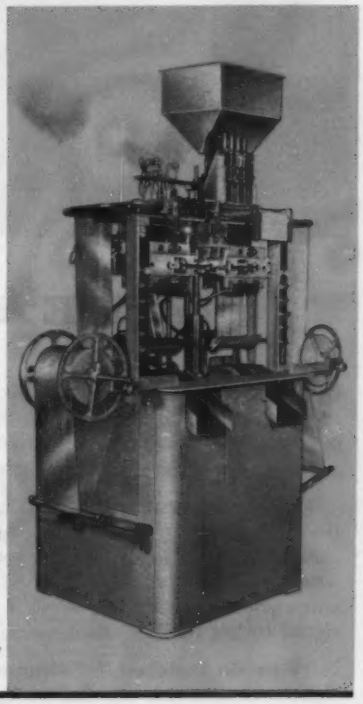
FOR BOTH LIQUIDS AND POWDERS

Completely Automatic production of up to 300 packets per minute. Interchangeable for ALL POWDER OPERATION — ALL LIQUID OPERATION — SIMULTANEOUS LIQUID AND POWDER OPERATION.

Produces up to 8 packets simultaneously. Packet sizes are variable from 1" x 1" to 8" x 8". The BFM Multiple Packeter forms, fills and heat seals — on all sides of the packet — from a continuous roll of heat-sealing material. A complete range of papers, foils, films and laminates can be handled, with electric eye registration of the printed material on both sides of the packet. Packets can be delivered in perforated strips *or* joined *or* individually.

POWDERS — Highly accurate volumetric or auger feeders for all free-flowing, granular and hygroscopic powders. Two different powders can be inserted into each packet. Hoppers can be divided for mixed filling.

LIQUIDS — The Multiple Packeter handles all free-flowing, viscous and semi-viscous liquids. Reverse vacuum design prevents stringers and leakers. Moyno or piston pumps available.



MODEL II showing simultaneous liquid and powder operation

For complete details on the new BFM Multiple Packeter Model II, write to:

BROWN

FILLING MACHINE COMPANY, INC.

Division of FRANKLIN RESEARCH CORPORATION

FITCHBURG, MASSACHUSETTS

A HEALTH *plus* ON YOUR LABEL

● Every meal she sets on her table must meet two basic requirements . . . it's like second nature to her: a meal must be *appetizing* and *health-providing*. With these goals in her subconscious, what happens in the store?

The grocery store is the proving ground of competition. *Hundreds of powerfully advertised brand names compete for her favor,* for her judgment of what will provide appetizing, health-providing meals. That's when your food product needs *a plus on the label,* a signal to her health-consciousness!

"Vitamin Enriched," "Vitamin Fortified." Those signals, those words can make a big difference today in moving *your product* to her table. Why not let a Pfizer representative tell you *in his words* the full details on how Pfizer vitamins can significantly increase your product's sales potential. Pfizer has been a major vitamin research and production center since the first vitamin was commercially produced.

Here are just 3 examples of food products that are increasing sales with Pfizer vitamins:

A health plus on the label of carbonated beverages says "Vitamin C Fortified" (and means sales). You can add the full daily requirement of Vitamin C for less than 1½¢ per case of 24, 12 oz. bottles.

Pfizer experience can help you put the health

MOVES PRODUCTS TO HER TABLE

A health plus on the label of flour, macaroni and similar products says "ENRICHED" *(and means sales).* New light-color Pfizer BI-CAP is now simplifying the problem of enriching white flour for many millers.

A health plus on the label of canned juices and concentrates says "Vitamin Fortified" *(and means sales).* Fortification here will offset processing losses and seasonal variations in natural vitamins.

* * *

What's the most powerful *plus* you can offer the food shopper? It's those extra health words on your label. Let Pfizer help you put them there.

Quality Ingredients for the food industry for over a century

Pfizer

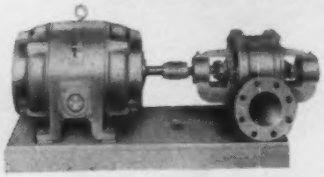
CHAS. PFIZER & CO., INC.
Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Chicago, Ill.;
San Francisco, Calif.; Vernon, Calif.;
Atlanta, Ga.; Dallas, Texas

plus on your label simply and economically

BUILT-IN ASSURANCE

To Help Make Your Plans Work As Specified...

F-M WESTCO PERIPHERAL PUMPS



boiler feed
condensate return
hot and cold liquids
chemicals
refrigerants, etc.

Up to 200 gpm., pressures to 900 ft. High pressure at normal operating speeds. Handle widely varying heads with little change in capacity. Sizes 1¼" through 2½".

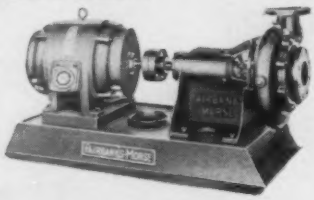
F-M BUILTOGETHER CENTRIFUGAL PUMPS

hot and cold liquids
liquid circulation
low-viscosity liquids
boiler feed
cooling towers, etc.

Up to 900 gpm., pressures to 525 ft. Close-coupled pump and motor units mount horizontal, vertical or angular. Sizes ¾" through 5".

F-M NON-CLOG PUMPS

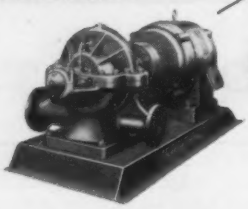
plant waste
slurries
paper stock
fruit
fish
vegetables, etc.



Up to 30,000 gpm., pressures to 175 ft. Sizes 2" through 20". Vertical or horizontal. Bladeless or conventional.

F-M SPLIT-CASE CENTRIFUGAL PUMPS

water supply; plant service
booster; circulating
air conditioning
refrigeration
chemical liquids
boiler feeds, etc.



Up to 50,000 gpm., pressures to 700 ft. Sizes 1½" through 36". Single stage or multistage.

The best-laid plans can go astray when mechanical equipment fails to deliver according to expectations or fails to give sustained peak performance. That's why Fairbanks-Morse builds something extra into all pumps so your plans work *as specified.*

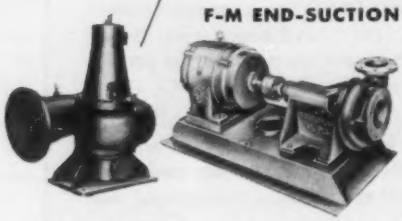
F-M Pumps You Can Rely Upon

Full-rated capacity guaranteed...with built-in safety margin to assure maximum efficiency under most severe use. Rugged, durable, precision-made to maintain efficiency with minimum service.

Expert Help When You Want It

F-M Engineers are ready to work with you on any of your pump problems.

F-M END-SUCTION PUMPS



hot and cold liquids
chemicals
circulating liquids
low-viscosity liquids
cooling towers
condenser circulation, etc.

Up to 100,000 gpm., pressures to 250 ft. Sizes ¾" through 54". Horizontal or vertical.

For full information about Fairbanks-Morse pumps, call your F-M Sales Engineer or write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY RAIL CARS • HOME WATER SERVICE EQUIPMENT • MAGNETOS

FE SERVICE CENTER

Catalogs p.157
Books p.166
Patents p.173
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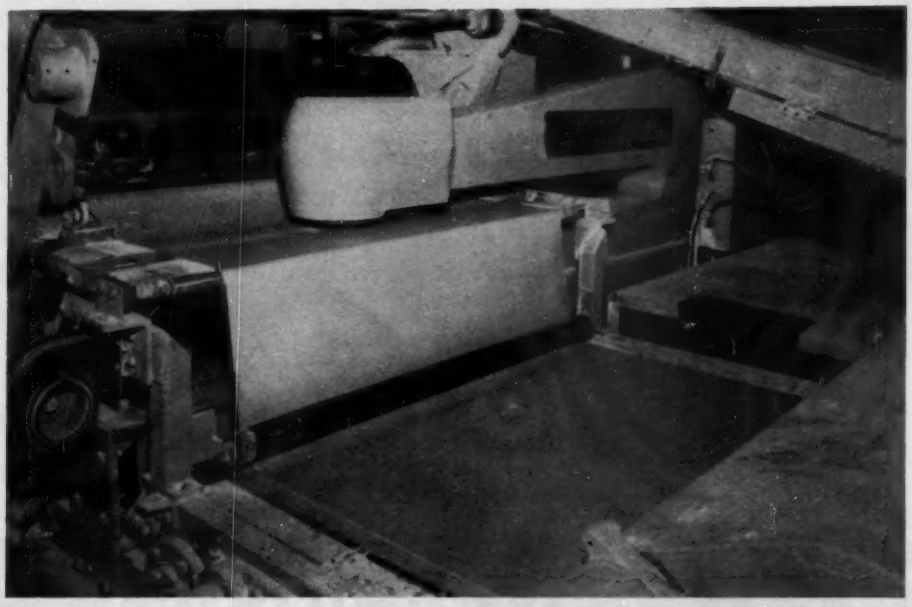
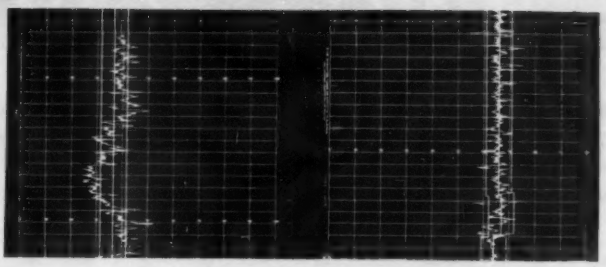
Advertisers' Index p.182
Reader Service p.184

NEW EQUIPMENT & SUPPLIES



ELECTRONIC THICKNESS DETECTOR continuously scans dough sheet in soda-cracker operation. Data are fed to recorder-and-control unit (not shown) that actuates any required correction in roller setting.



HIGH DEGREE OF CONTROL is indicated by comparing recordings of dough-thickness variations when line was manually supervised (left), and after electronic feedback system was adopted (right).

In-Line Feedback Unit Controls Product Thickness

Precision in-stream control of product thickness is offered by a new 3-component electronic system that continuously gages the variable, makes automatic compensating corrections, and records the data.

Called "AccuRay", it consists of a non-contacting measuring unit on the production line, and a console housing a continuous recorder and controller. In its first food-industry application, processing of soda crackers, unit accomplishes these important control functions:

1. Holds weight per cracker constant to standardize number per pound.

2. Minimizes product give-away by close control of sheet thickness.

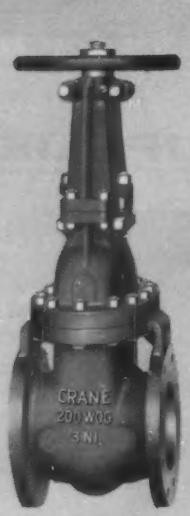
3. Improves taste and appearance of crackers, which are now baked from a uniform sheet.

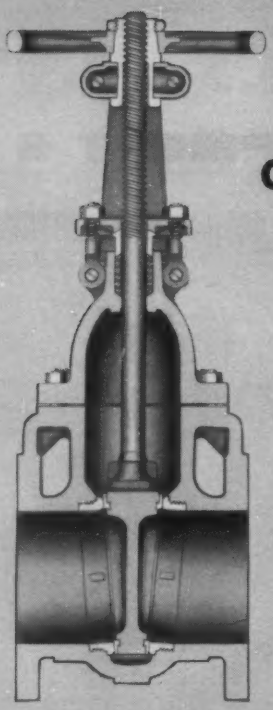
Former control method, weighing samples at oven discharge, was hampered by the time lag in transmitting corrective adjustments back to dough-rolling area. Delays ranging 5-15 min. permitted uncontrolled production of 75,000-250,000 crackers.

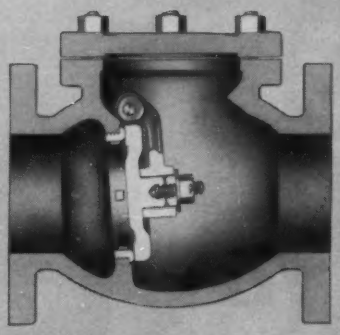
In current operations, however, sheet thickness is accurately gaged just before dough enters oven. Measurement signals are transmitted to console for read-out, thus provide a continuous record of sheet thickness.

NEW CRANE VALVES FOR PROCESS INDUSTRIES

3% NICKEL ALLOY CAST IRON







Gates and Swing Checks

18-8 SMo (Type 316) Alloy Trimmed

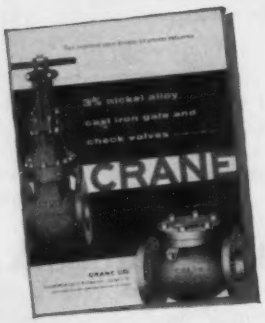
11 SIZES — 2 TO 18 INCHES

Better Corrosion Resistance . . . Longer Life . . . on More Fluids

This metal—Crane 3% nickel alloy iron—was developed especially to extend the usefulness and economy of cast iron valves in the process industries.

At but slightly higher cost, Crane 3% nickel iron valves provide substantially better resistance to corrosion than ordinary cast iron, and they have notably higher physical properties. Efficiency is stepped up further with Crane 18-8 SMo (Type 316) stainless steel trim.

Typical Recommended Applications: You will save with these valves —in the petroleum industry, for example—on oils containing traces of mineral acids; in wood-treating processes—on creosote vapors and oils; in pulp and paper mills—on alkaline liquors of various kinds. In general, they should be considered where all-iron or brass-trimmed iron valves are subject to seat corrosion.



ASK FOR THIS CIRCULAR

Complete technical and specification data on these valves are given in Circular AD-2313. Ask your Crane Representative for a copy, or write to address below.

CRANE VALVES & FITTINGS

PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill.—Branches and Wholesalers Serving All Areas

Simultaneously, controller computes any required corrections and actuates instantaneous, continuous feedback control of dough rolls.

Production records now show 50% improvement in thickness control. And time saved by eliminating weight sampling has enabled additional production. Finally, there has been a sharp decrease in product rejection due to deformed or burned crackers. — *Industrial Nucleonics Corp., 1205 Chesapeake Ave., Columbus, Ohio.*

Circle 16 on Reader Service Card

Checkweigher Feeds Back Process-Control Data

This high-speed checkweigher supplies a binary coded output signal to auxiliary units that record, classify, and feed back corrections to filling or processing equipment.

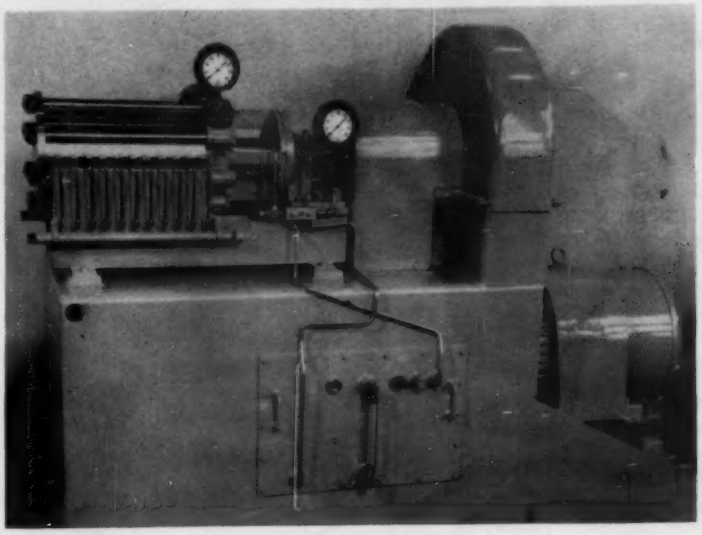
Known as Model 1206, it makes up to 120 weighings per min. with accuracy of 0.2%. Higher operating speed is possible at lower accuracies, and vice versa. Unit employs an even-balance lever system (Shadowgraph) and weight indication by an optical light-projection system.

Electronic control is by direct reading crystal photocells mounted alongside the optical scale dial.— *Exact Weight Scale Co., 538 E. Town St., Columbus, Ohio.*

Circle 17 on Reader Service Card

Want More Information?

It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one at the bottom of each item) on the handy Reader Service Postcard—back of book. Then sign your name and address and mail. For your convenience, too, these items are listed and keyed in the Reader Service Section.



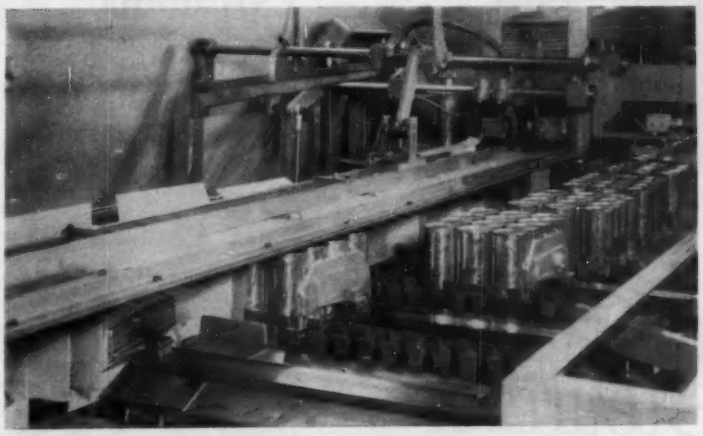
Continuous Reactor Mixes, Cools, Heats

Continuous mixing with precision heat transfer in this processing unit enables efficient texturizing, aeration, pasteurizing, and processing of starch, pie fillings, and cake batters.

Called Flow Master, it consists of fixed plates through which heat-transfer fluid may be circulated, or plates can be electrically heated. Spaced between each plate are beaters (mounted on a common shaft) that mix the realtively small volume of material flowing through channels of each plate. High turbulence boosts heat-transfer rates.

Unit operates at pressures to 350 psig. and temperatures of 32-400F. Standard construction is stainless steel. Plates are 11- and 18-in. dia. —*Baker Perkins, Inc., Chemical Machinery Div., Saginaw, Mich.*

Circle 18 on Reader Service Card



24-Can Packer End-Loads 50 Cases Per Min.

By filling 50 end-loaded cases per min., this 24-can case packer combines high operating speed with broad savings available through use of such cases—reportedly $13 to $15 per 1,000.

Called CMP, unit receives cans directly from line and separates them automatically into six lanes. Next, it indexes cans from each line (in groups of four) directly into constantly moving conveyor buckets.

Ingredients p. 147
Chemicals p. 148
Briefs p. 150

New way to Code Cans, Jars, Bottles

Compact, portable attachment adapts to any line

The Gottscho "Model TB" MARKOCODER® machine is a unique, fully automatic, packaging line attachment for coding *bottoms* of cans, jars, bottles, canisters, paper containers at speeds up to 600 per minute. Makes consistently clean, permanent ink imprints. Designed for quick code changes, simple maintenance, easy adjustment for different size cans. Offers all the advantages of a fixed-installation imprinter without requiring alteration of present line set-up.

Write for descriptive circular "TB" . . . if interested in imprinting tops of cans, jars, etc. ask for Bulletin "RIN-7".

Gottscho

ADOLPH GOTTSCHO, INC.

Dept. G, Hillside 5, N. J.

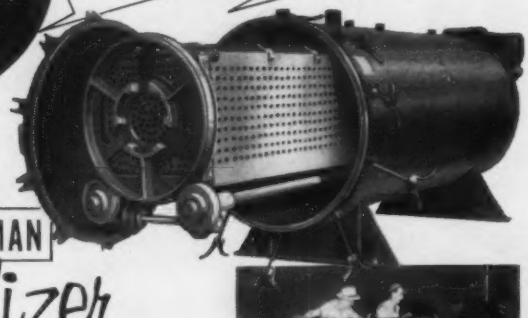
In Canada: **RICHARDSON AGENCIES, LTD., Toronto & Montreal**

Automatic Production-Line

CODING, MARKING, IMPRINTING MACHINES

For more data, circle 325 on Reader Service Card

for BETTER RETENTION of . . . . . flavor • color • vitamins



BERLIN-CHAPMAN

Sterilizer

Widely used by the largest food packers in the country . . . usually set up in a battery of 4 or 5 for one line of food at 120 cans per minute . . . made in three sizes to hold thirty, twenty, or fifteen cases of tall cans . . . equipped with one cage, one cage truck and one set of 96 trays . . . all shells tested to 40 lbs. hydraulic pressure for working pressures up to 20 lbs. Also ASME code stamping. Write today for complete information and recommendations of sizes to meet your plant setup.

Other Berlin Chapman Products Vertical Retorts • Brine and Pulp Tanks • Belt Conveyors • Shaker Graders • Rod De-Watering Reel • Rotary Washers • Scalders • Blanchers • Separators • Special Machinery for Food Processing.

OUR 50th YEAR

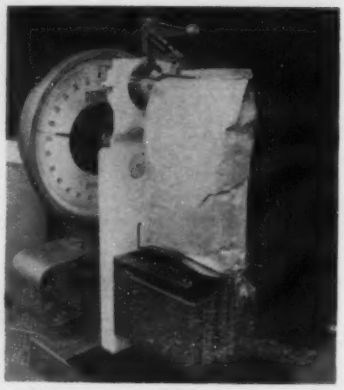
BERLIN CHAPMAN CO.

Berlin, Wisconsin

Cases are automatically fed from a magazine (holding up to a 3-min. supply), opened, and deposited into a transport.

As groups of 24 cans move parallel to corresponding cases, a constant-motion loading mechanism loads them. Flaps are spread for gluing, then case is closed and passed into a drying conveyor.—*R. A. Jones & Co. P. O. Box 485, Cincinnati.*

Circle 19 on Reader Service Card



Vibrating Settler Speeds Bagging of Bulky Items

This unit offers higher-speed precision bag filling of low-density products.

Called Model "B", it permits material to settle in bag during entire filling cycle without affecting packer's weighing mechanism or transmitting vibration to scale. A simple adjustment varies intensity and frequency of vibration according to product requirements.—*H. L. Stoker Co., 111 S. College Ave., Claremont, Calif.*

Circle 20 on Reader Service Card

Multi-Purpose Cart Eases Drum Handling, Pouring

This cart and tilting mechanism offer safe and easy moving and emptying of loaded steel drums. In

For more data, circle 326 on Reader Service Card

For more data, circle 327 on Reader Service Card→

open motors for extreme conditions

Save up to 60%!

Here's an amazing advance in motor technology! It's the *Super-Seal* motor line — an open motor design so completely unaffected by moisture, dust, dirt, oil, acids and alkalis that it can be used in many applications previously requiring more costly enclosed motors. *Savings range from 15 to 60%.*

Super-Seal motor superiority results from revolutionary insulating techniques. Available in any integral horsepower size, smaller *Super-Seal* motors incorporate an encapsulated stator. A durable epoxy resin encloses the stator, creating an electrical system impervious to outside elements.

In larger sizes, *Silco-Flex* insulation is used. In this system, silicone rubber is vulcanized into a homogeneous mass to form a flexible, moisture and heat resistant, void-free dielectric barrier around coils and leads.

Both of these insulation systems are unsurpassed. Proof? An encapsulated motor ran for hundreds of hours at full load in a 4% brine solution.

Find out more about new economies in motors from your A-C representative or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin. *Silco-Flex and Super-Seal are Allis-Chalmers trademarks.*

ALLIS-CHALMERS A-C ALLIS-CHALMERS

A-5802

IS Flavor Control YOUR PROBLEM?

Mono Sodium Glutamate, when used in the proper quantity, is the key to over-all control of the flavor variables involved in food processing.

Catching up with your competition, maintaining your position in today's competitive market, or leading the field, may depend on your decision to use MSG.

MSG blends, strengthens and preserves the natural fresh flavors of your product. It creates a uniformity of taste, a flavor identity which is the first step in establishing lasting consumer brand preference.

Great Western's MSG is available in bulk 100 lb. and 25 lb. drums.

THE SECRET OF GOOD TASTE ®

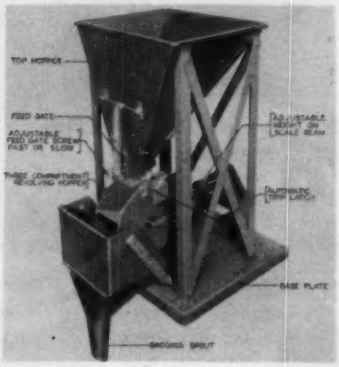
GREAT WESTERN
MSG
99+% Pure Mono Sodium Glutamate Crystals

THE GREAT WESTERN SUGAR COMPANY
Denver, Colorado

addition, a container can be locked in position and rotated for mixing.

To move a drum, cart is rolled into position and latched to drum. Pulling handle down locks container and raises it 7½ in. from floor (leverage ratio, 8:1). Contents may be poured or emptied by inclining drum to desired position and locking.

Pushing handle all the way down automatically locks the cradle for rotating drum end over end to mix either liquids or powders.—*Hodgson Engineering & Mfg. Co., Tulsa, Okla.* Circle 21 on Reader Service Card



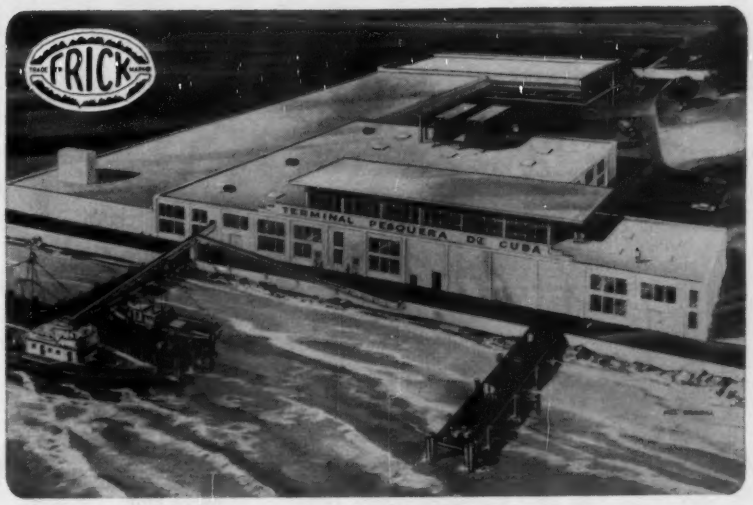
Motorless Weigh-Filler Operates at 20/Min.

Gravity operated, a new bench-model weighing and filling unit for free-flowing materials makes 18-20 accurate weighings per min.

Automatic unit (Model GF) is designed for small-scale packaging of items such as rice, sugar, and tapioca. Capacity of standard machine is 5 lb. and, since no motor or agitator is needed, operation is simple and maintenance is minimized. Attendant merely replaces containers as they are filled.

In operation, material placed in a top hopper flows into the uppermost compartments of a 3-compartment weigh hopper. When latter's weigh beam is balanced, a retaining latch is automatically released, allowing hopper to rotate one-third of a cycle. Weighed material then drops through a discharge spout into a waiting container. As hopper rotates, it turns up an empty compartment for next weighing, and process is automatically repeated as long as there is material in feed hopper.

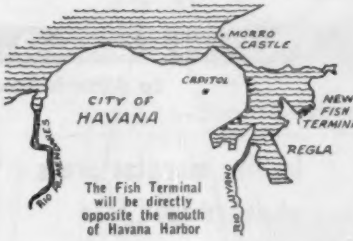
Top-hopper capacity is 20-50 lb., depending upon product density. Unit is about 36 in. high, 16 in.



The World's Finest Fish Terminal

Is Now Being Built at Havana . . . This will measure 415 by 268 feet, and have complete facilities.

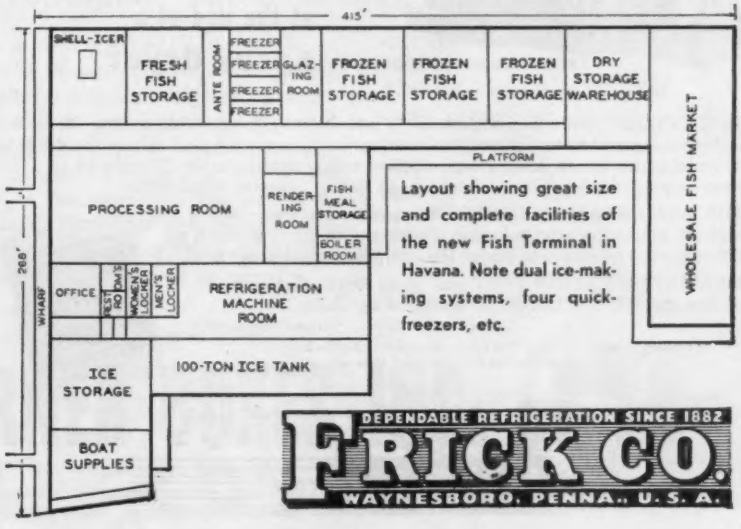
Here nine Frick compressors, producing 500 tons of refrigeration, will supply eight vital services:



- Cooling and icing the fresh fish when graded
- Storing 1¼ million pounds of fresh iced fish
- Quick-freezing 100,000 pounds of frozen fish
- Storing 2 million pounds of frozen fish
- Automatically making 20 tons of broken Shell-Ice daily
- Freezing 100 tons of block-ice daily
- Storing 900 tons of block-ice
- Air conditioning the sales, dining, and conference rooms, laboratory and offices.

Send for folder giving complete details of this remarkable Terminal. And specify Frick equipment for that important cooling job of YOURS. Estimates cheerfully furnished: write today to

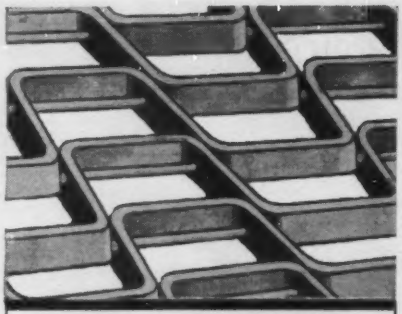
FRICK COMPANY • WAYNESBORO, PENNSYLVANIA



DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U. S. A.

For more data, circle 329 on Reader Service Card

Wash • Drain • Cook • Freeze • Dehydrate Food Faster on:



LA PORTE
FLEXIBLE STEEL CONVEYOR BELTING

Whether you are Canning, Freezing, Dehydrating or Pickling, the open mesh construction of La Porte Flexible Conveyor Belting will save you time and money. Besides, it facilitates sterilizing with steam guns or scalding water, also provides a perfectly smooth surface for containers empty or filled. Cuts packaging and shipping costs, too.

For maximum service with minimum maintenance, specify La Porte Belting.

Available in ½" x 1" also 1" x 1" mesh in any length and practically any width.

Ask your Mill Supplier or write for illustrated literature, prices.

LA PORTE

MAT AND MFG. CO.

BOX 124 — La Porte, Indiana

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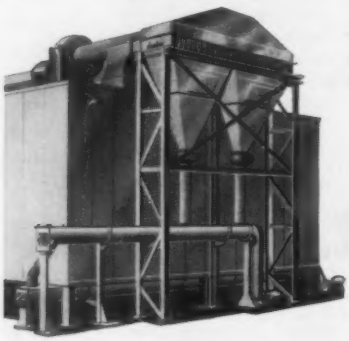

leading manufacturers* of dehydrated food products insist on the

DUSTEX MICROCLONE

at the end of a spray dryer

MICROCLONE cast tubes with smooth interior surfaces provide a cling-free, self-cleaning action to assure maximum material recovery, and allows the dryer to operate at maximum designed production rate—*continuously*. There's no time or place for "cooking"—hence, peak flavor...greater solubility.

THE ALL METAL MICROCLONE is protrusion free—meets the highest sanitation requirements. There are no moving parts, no filters to clog, no sludge to pump. It's virtually maintenance free!

LOW INSTALLATION COST and up to 99.8% efficiency makes the MICROCLONE the leader of the field.

*Name on request

Write today for this free folder explaining the technical characteristics of the "quick opening" Microclone.

P.O. BOX 2520 • BUFFALO 25, N.Y.

DUSTEX CORP.

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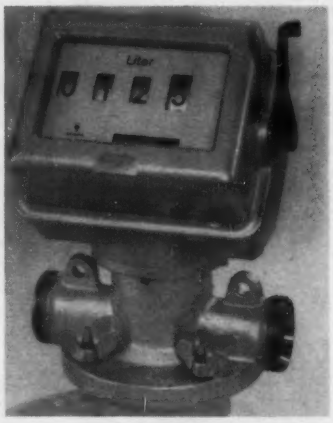
Equipment & Supplies

wide, and 20 in. long.—*Richardson Scale Co., Van Houten Ave., Clifton, N. J.* Circle 22 on Reader Service Card



Meters 1½-20 GPM. Flow With 0.5% Accuracy

Handling practically any liquid that will flow, this sanitary meter offers accuracy of 0.5% of full scale in the difficult 1½-20 gpm. range.

Unit (Siemens) is made of Series 400 stainless, withstands 100 psi., and can be disassembled for cleaning in about 30 secs. Since basic drive is a magnetic coupling (no stuffing boxes or packing glands), product cannot enter the gear-train mechanism.

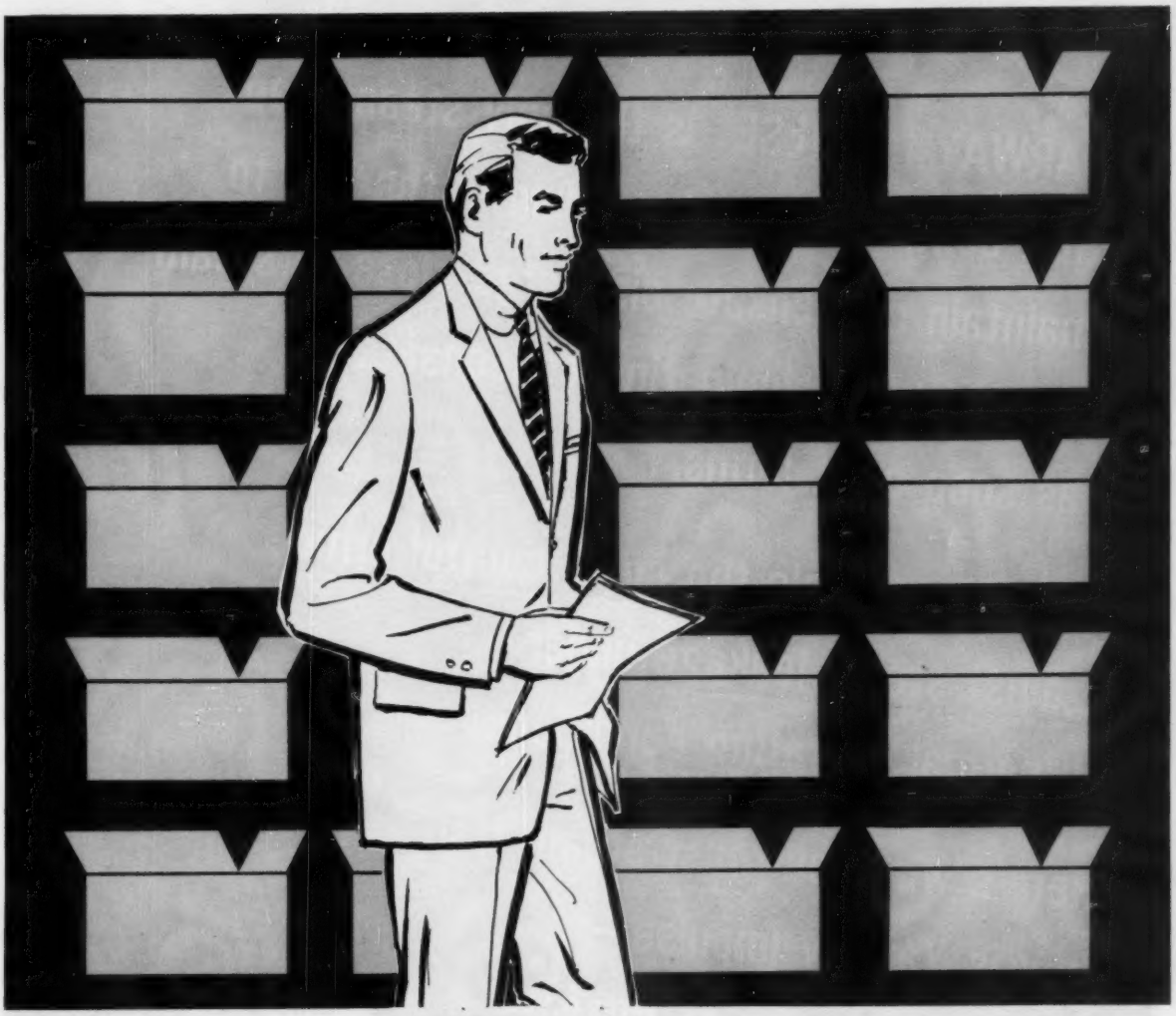
Meter comes with standard sanitary 1½-in. fittings, and with either dial or roller register.—*T. E. A., Inc., 141-21 72nd Ave., Flushing, New York City.*

Circle 23 on Reader Service Card

Bag's Single Gusset Offers Extra Usable Space

This single-gusset, sewn-valve multiwall bag offers extra usable space because of its flat tube side, also easier product filling and fewer blowouts.

In filling, products (such as flour) do not back up and clog the spout, which cuts packaging time and labor



HOERNER BOXES

pack a reputation for efficiency and economy!

We specialize in solving difficult packaging problems. Every day, Hoerner Packaging Engineers face these typical questions: How can we effect savings in materials? Can we cut down on our shipping costs? Is there any way to reduce damage claims? How can better packaging add to the sales appeal of our product? The success of Hoerner Packaging Engineers is reflected in the "case" histories of outstanding firms throughout America. What's your packaging problem?

FREE CONSULTATION BY HOERNER PACKAGING ENGINEERS:

A Hoerner Engineer will gladly make a thorough analysis of your packaging operation. It won't cost you anything—but it will help you cut costs! Act now—***call or write to the Hoerner office or plant nearest you.***

"Success is shipped in a Hoerner container"

PACKAGING ENGINEERS—
Designers and manufacturers of corrugated boxes.

HOERNER BOXES, INC.

GENERAL OFFICES: 600 Morgan Street, Keokuk, Iowa

PLANTS: Keokuk, Des Moines and Ottumwa, Iowa • Sand Springs, Oklahoma • Fort Smith and Little Rock, Arkansas
Sioux Falls, South Dakota • Minneapolis, Minnesota • Fort Worth, Texas • Mexico City, Mexico

For more data, circle 332 on Reader Service Card

YARWAY IMPULSE* is the only steam trap that continually samples fluid in the line to maintain condensate discharge close to steam temperature, eliminating condensate as soon as it forms.

Condensate seals the small control orifice against steam leakage under all normal operating conditions.

Here's why your best steam trap buy is Yarway Impulse—

1. GETS EQUIPMENT HOT FAST—AND KEEPS IT HOT
2. ONLY ONE MOVING PART
3. LOW MAINTENANCE
4. SMALL SIZE—LIGHT WEIGHT
5. GOOD FOR ALL PRESSURES
6. NON-FREEZING
7. COMPLETE LINE FOR EVERY REQUIREMENT

ONLY ONE MOVING PART, A SMALL STAINLESS STEEL VALVE, ACTUALLY "FLOATS" ON THE CONDENSATE LOAD.

Actual size ¾" trap

* A COMPLETE LINE OF STEAM TRAPS, ALL OPERATING ON A PROVEN THERMODYNAMIC PRINCIPLE.

YARWAY impulse®

Manufactured by YARNALL-WARING CO., 127 Mermaid Ave., Philadelphia, Pa.
Stocked and sold by 127 Industrial Distributors
Write for free bulletin "The Why and How of Steam Trapping"

For more data, circle 333 on Reader Service Card

For more data, circle 334 on Reader Service Card→

Color forecasts flavorful pleasure!

Today color is being used more expertly than ever to emphasize the goodness of packaged foods.

As we have been doing for more than a half-century, National Aniline helps food processors to increase appetite appeals with color. Our basic research works untiringly to broaden the spectrum of pure, uniform National Food Colors, already the most complete line available. And our Technical Service Laboratories render practical assistance in application.

If you need help in reformulating colors for your existing lines or are introducing a new product, we will be glad to work with you . . . in confidence, of course.

National®
CERTIFIED
FOOD
COLORS

Allied Chemical

NATIONAL ANILINE DIVISION ALLIED CHEMICAL CORPORATION • 40 RECTOR STREET, NEW YORK 6, N. Y.
Boston Charlotte Chicago Philadelphia Portland, Ore. San Francisco Toronto

This is Why the Nash is the Most Simple Compressor

It's the Nash!

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

Nash Compressors produce 75 lbs pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods Data on these pumps sent immediately on request

No internal wearing parts.

No valves, pistons, or vanes.

No internal lubrication.

Low maintenance cost.

Saves floor space.

Desired delivery temperature automatically maintained.

Slugs of liquid entering pump will do no harm.

75 pounds in a single stage.

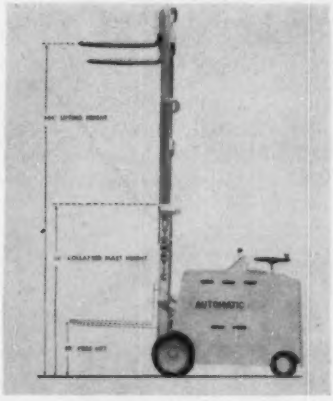
NASH ENGINEERING COMPANY

313 WILSON, SO. NORWALK, CONN.

requirements. Extra space afforded by flat tube side may also cut costs by permitting use of a shorter bag.

Units, which closely resemble two-gusset multiwall bags, stack uniformly when filled and can easily be palletized.—*Bemis Bros. Bag Co., 408 Pine St., St. Louis.*

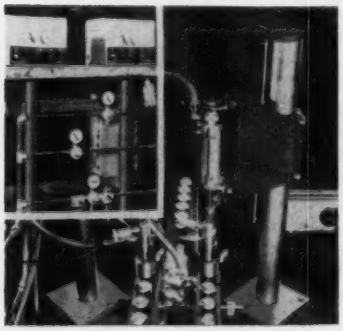
Circle 24 on Reader Service Card



Cite Dual-Purpose Feature Of High-Lift Fork Truck

Quicker moving of high-stacked loads out of storage and into low-ceiling highway trailers is reported with use of this new lift-truck mast.

Designed for maker's 2,000- and 3,000-lb.-capacity units, attachment (Sky-Hi-Lift) thus converts a truck into a dual-purpose machine. With collapsed mast height of 68 in. and 144 in. of lift, it also enables use of non-productive overhead areas when stacking goods.—*Automatic Transportation Co., 149 W. 87 St., Chicago.* Circle 25 on Reader Service Card



Pressure-Tests and Vents 60 Aerosol Cans Per Min.

Spot checking of aerosol containers may be eliminated with use of this conveyor-line pressure tester and venter. (*Turn page*)

Yes! GLOBE hycar® BELTING

IS NOW AVAILABLE

GLOBE HYCAR BELTING gives you all the benefits you ever expected for food conveying, PLUS many new features. It resists those animal fats, vegetable oils and greases that deteriorate natural rubber and Neoprene.

IT STAYS pliable at below zero temperatures, maintains stability at 250°F above zero—and resists cracking after long service.

GLOBE HYCAR BELTING is odorless, tasteless, non-toxic, non-porous and non-contaminating. It is easy to clean and keep sanitary. In cut widths up to 48 inches.

WHITE HYCAR, for conveying, in 2 to 5 plies inclusive.

GREEN HYCAR, for picking and sorting tables, in 3 ply only.

MANUFACTURERS OF:

WHITE SOLID WOVEN COTTON BELTING • PRESS-CURED KANRY-TEX BELTING WATERPROOF AND WAX TREATED BELTING • HYCAR BELTING • NEOPRENE BELTING • PLASCELL BELTING • CELLULOSE BELTING • STITCHED CANVAS BELTING • ROUND BRAIDED ENDLESS BELTS • HEVALOID ENDLESS BELTS WOVEN ENDLESS BELTS • CLEANER AND SIFTER BRUSHES • WEBBINGS HOISTING SLINGS • BELT DRESSING

®Hycar American Rubber — T. M. The B. F. Goodrich Co.

GLOBE WOVEN BELTING CO., INC.
1400 CLINTON STREET • BUFFALO 6, NEW YORK

KNOWN FOR QUALITY THE WORLD OVER

For more data, circle 336 on Reader Service Card

3 NEW METHODS OF BULK HANDLING

SUPERIOR AIR CONVEYING REALLY CUTS COSTS

1. Air unload powder or granular material efficiently with the new Superior "CYCLO-VAC".

2. Convey material anywhere through sanitary pipelines with a Superior "FLUIDIZER".

3. Switch lines instantly, "on stream" with the new Superior flow diverter.

Superior . . . most advanced in modern air handling

Product Sales or Systems Engineering

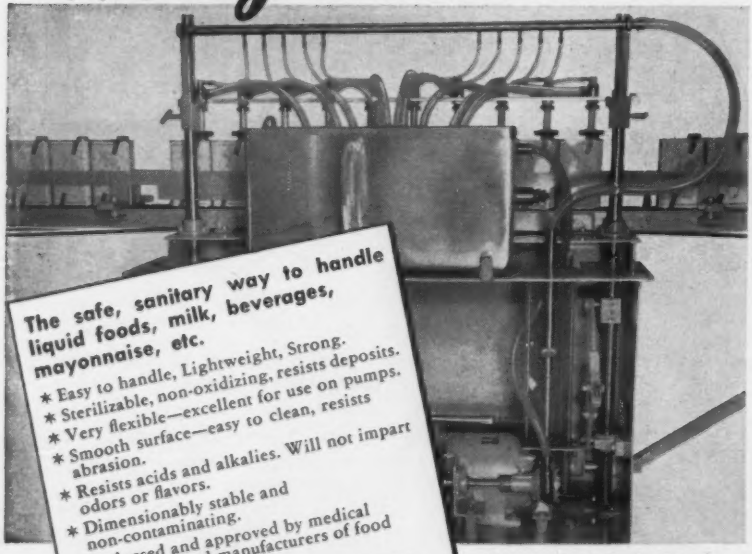
Superior

PROCESS MACHINERY DIVISION

SUPERIOR SEPARATOR CO.
121 S. Washington, Hopkins, Minn.
WEst 8-7651

For more data, circle 337 on Reader Service Card

Mayon CLEAR, NON-TOXIC VINYL FOOD TUBING



The safe, sanitary way to handle liquid foods, milk, beverages, mayonnaise, etc.

* Easy to handle, Lightweight, Strong.
* Sterilizable, non-oxidizing, resists deposits.
* Very flexible—excellent for use on pumps.
* Smooth surface—easy to clean, resists abrasion.
* Resists acids and alkalies. Will not impart odors or flavors.
* Dimensionably stable and non-contaminating.
* Endorsed and approved by medical authorities and manufacturers of food processing equipment

Available ⅛" thru 2½" internal diameter

Mayon plastic food tubing as used on the Biner Ellison Straightline Vacuum Filler.

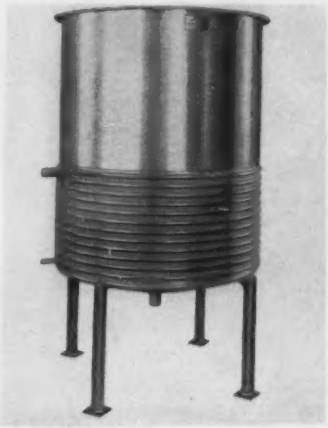
SEND FOR CATALOG AND PRICE LIST

MAYON PLASTICS
415-17TH AVE. NO. • HOPKINS, MINN.
Phone: WEst 5-2187

Equipment & Supplies

Handling up to 60 cans per min., unit automatically vents gas without discharging the product, fills dip tube to any desired level, tests for correct pressure, and rejects all out-of-tolerance containers. Equipment may be installed on any aerosol line in single or double rows. Containers automatically position themselves under the testing head. Only power requirements are a 110v. outlet and an air supply.

Two models are available, CA-1 for packages with dip-tubes on valves, and CA-8 for containers with upside-down valves (no venting or gas discharge).—*Robbins Engineering Co., 208 Maple Ave., North Haven, Conn.* Circle 26 on Reader Service Card



Built-in Panel Coils Cut Cost of Jacketed Tanks

For economy, panel coils of this new jacketed holding tank are made integral with the jacket. Tank capacities range 66-1,587 gal.

Jacket consists of two welded sheets—an outer panel (mild or stainless steel) embossed to form coil channels, and an inner flat sheet of stainless. All inside welds are ground flush to #4 finish, cone bottom has a sanitary radius, and top edge is reinforced with a stainless bar. Coil header has either a 1- or 1¼-in. male steam inlet and ¾-in. condensate outlet.—*F. H. Langsenkamp Co., 225 E. South St., Indianapolis.* Circle 27 on Reader Service Card

Latest Dairy Filling Line Delivers 14,000 Qt./Hr.

Equipment is now available for an automated dairy filling line that turns out over 14,000 qt. per hr.—re-

NOTHING SELLS LIKE FLAVOR!

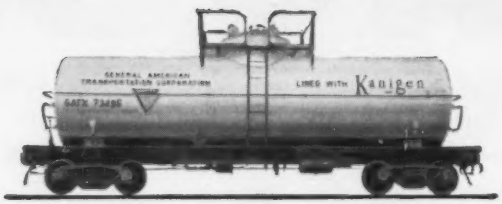
Thanks to the endless variety of quick-and-easy-to-use prepared food and dessert mixes now being marketed, today's housewife has more hours to enjoy outside of the kitchen than ever before—hours she can now put to more useful pursuits and purposes. As competition for her patronage of these time-saving products increases, she becomes more selective in her choice. By trial and error, she discovers the brand that best satisfies her family's taste, and sooner or later it is that brand with the best flavor that finds its place on her regular shopping list... When developing the flavoring or seasoning formulation for your new food, beverage, confectionery or dessert offerings, remember this: NOTHING SELLS LIKE FLAVOR! So, when you choose flavor, choose the *best*—use FRITZSCHE'S ... *A FIRST NAME IN FLAVORS SINCE 1871.*

FRITZSCHE BROTHERS, INC., 76 NINTH AVENUE, NEW YORK 11, N.Y.

A FIRST NAME IN FLAVORS SINCE 1871

Branch Offices and *Stocks: Atlanta, Ga., Boston, Mass., *Chicago, Ill., Cincinnati, Ohio, Greensboro, N. C., *Los Angeles, Cal., Philadelphia, Pa., San Francisco, Cal., St. Louis, Mo., Montreal and *Toronto, Canada; *Mexico, D. F. and *Buenos Aires, Argentina. Factories: Clifton, N. J., and Buenos Aires, Argentina.

THE TANK CAR NEWS OF 1958



GATX cars lined with Kanigen®... new nickel-alloy coating

KANIGEN, a unique patented process, deposits a hard, uniform, corrosion-resistant nickel-alloy coating on tank car interiors . . . lasts four to six times as long as phenolic, epoxy or neoprene linings. You can load at high temperatures that would destroy other linings. For example, 73% caustic soda can be piped in at unlimited temperatures.

Tank cars lined with KANIGEN are also being successfully used for liquids such as tetraethyl lead, ethylene oxide and glucose.

If your product is a liquid, GATX furnishes or can build a tank car to transport it. GATX maintains a nation-wide network of shops for servicing.

No capital investment . . . when you ship GATX.

KANIGEN is a trademark which identifies chemical nickel coating by GENERAL AMERICAN TRANSPORTATION CORPORATION and its licensees, the product resulting therefrom and compositions produced by them for use in chemical nickel coatings.

GATX GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South LaSalle Street • Chicago 90, Illinois

Offices in all principal cities

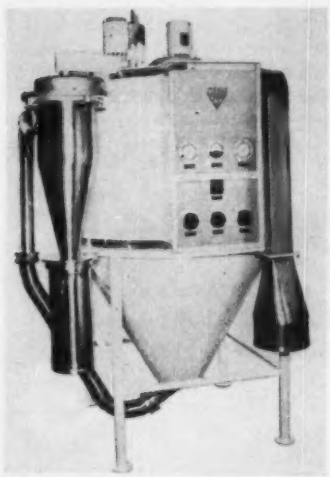
For more data, circle 340 on Reader Service Card

portedly twice the speed of any current operation.

Automation starts in the receiving room with a new carton filler (Canco) whose platform holds 189 flat-type quart cartons or 600 half-pint units. Operator merely places a bag of cartons on platform, tears off the cover, and tilts stack into operating position. Then, a suction device removes remaining part of bag, and cartons are aligned and fed single-file into conveyors that carry them to filling room.

Here, a new rotary filler (Canco) with 38 nozzles opens, fills, closes the cap, and discharges 240 quart cartons per min. Output of half-pints is 260 per min. In the model dairy, automatic case loaders would tie into conveyors carrying cartons from filler. Cases of cartons would then be sped on rollers or belts to delivery trucks.—*American Can Co., 100 Park Ave., New York City.*

Circle 28 on Reader Service Card



Pilot Spray Dryer Enables Low-Volume Production

Evaporating up to 100 lb. of water per hr., this spray dryer is termed ideal for moderate production or pilot-plant work.

Known as Utility Spray Dryer, it permits efficient handling of heat-sensitive materials. Ease and speed of cleaning is of particular value where inter-contamination between batches must be avoided and change-over time minimized. All product-contact parts are stainless steel, and several designs are available to meet individual requirements.

Overall dimensions: Length 5 ft. 10 in.; width 5 ft. 4 in.; height 8 ft.

New types of Patapar® give you a

REAL BARRIER

against penetration of

GREASE, FATS, OILS

As an inner protective barrier for multiwall bags . . . or wherever a grease-proof material is required, new types of Patapar Vegetable Parchment meet the most exacting requirements. These special grease-proof Patapars stop penetration. Oil will not spread on Patapar's surface. There is no grease "crawl".

Wet-strength, too

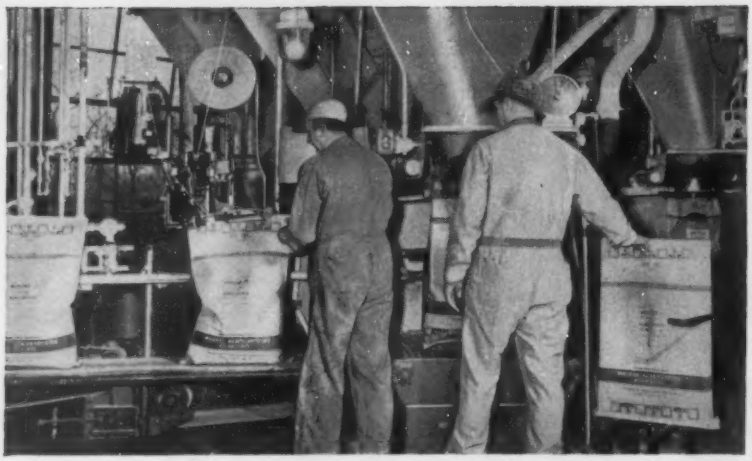
Permanent high wet-strength is another quality of the many different types of Patapar. And, made from pure cellulose, Patapar is odorless, non-toxic. It is furnished plain or colorfully printed.

If you would like to test Patapar for your product, write us telling your requirements. We'll send information and samples of the type we recommend for your purpose.

Patapar®
VEGETABLE PARCHMENT
HI-WET-STRENGTH · GREASE-RESISTING

HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

For more data, circle 341 on Reader Service Card



Richardson recommends
4 WAYS TO SAVE
WASTED BAGGING DOLLARS

1. **Minimize Weight Give-Away.** Frequently, you're forced to set mean bagging weights high, to prevent falling short. With an inaccurate scale, you can lose more than $10 an hour through weight variations—especially when bagging at high speeds. Many processors have solved this problem by installing Richardson bagging scales. With average accuracy of ± 1 to 2 oz. or better, they prevent overweights and underweights, year after year.

2. **Spend Less for Bags.** You may be paying good money for nothing but "air space" in filled bags. A Richardson G-73 Impacker can end this waste. The Impacker is a simple, compact accessory that quickly "shakes down" material as it fills bags. Thus, you can pack any given quantity into smaller, neater bags. The money you save—on bag size alone—can bring you profits well beyond the cost of this equipment.

3. **Speed Up Production.** Example: the Duplex Richardson E-50 Bagging Scale can turn out twenty 100-lb. bags per minute. It's only one of many Richardson models for handling flour, sugar, rice, feed, and chemicals, in bagging ranges of 25-250 lbs.

4. **Cut Excessive Labor Costs.** Are your bagging operations overmanned? Some installations require expensive standby labor. You can cut out this cost—sometimes as much as one-third of regular labor costs—and free labor for productive work, by installing *automatic* Richardson bagging equipment. Time and labor-saving accessories include automatic feeders, sewing conveyors and pedestals, bag-holders, as well as packers like the Impacker described above. Low-cost automatic proportioning systems are Richardson specialties, too. Simple design makes maintenance easy. Any maintenance man can understand a Richardson. And, *only* Richardson maintains a nationwide service organization that can serve you *within 24 hours,* if necessary.

Richardson Scales conform to U. S. Weights and Measures H-44 for your protection.

FOR MORE INFORMATION ON RICHARDSON BAGGING SCALES, WRITE TODAY TO

Richardson
MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY • CLIFTON, NEW JERSEY
Sales and Service Branches in Principal Cities
Also manufactured in Europe to U.S. standards 1208

Equipment & Supplies

6 in. Weight is 2,050 lb.—*Nichols Engineering & Research Corp., 70 Pine St., New York City.*
Circle 29 on Reader Service Card

Tubeless Instrument Line For Closed-Loop Control

Numerous advantages are cited for a new line of solid-state control instruments.

Called Electronic Consotrol Instrumentation, it consists of advanced-design transmitters, recorders, controllers, and valve operators that cover every function in the process-control loop. In addition to use of magnetic amplifiers and transistors, line offers: Choice of motion-balance or force-balance transmitters; electrical measurement converters mounted for front-of-panel accessibility; new control-station design; and diversified installation arrangements using standard components.

Typical measurements such as pressure, flow, and level are converted to proportional current signals and instantly transmitted over unshielded lines to control center. Converters for voltage and resistance measurements also feed signals to panel-mounted receivers.—*Foxboro Co., Foxboro, Mass.*
Circle 30 on Reader Service Card

INGREDIENTS

Dried-Orange-Peel Flavor Guarded by New Process

A new dehydrated orange peel, with essential oils sealed-in by a new process, reportedly retains full flavor even after being finely granulated. Sealing agent is an anhydrous, sugar-like syrup in which peel is boiled under vacuum.

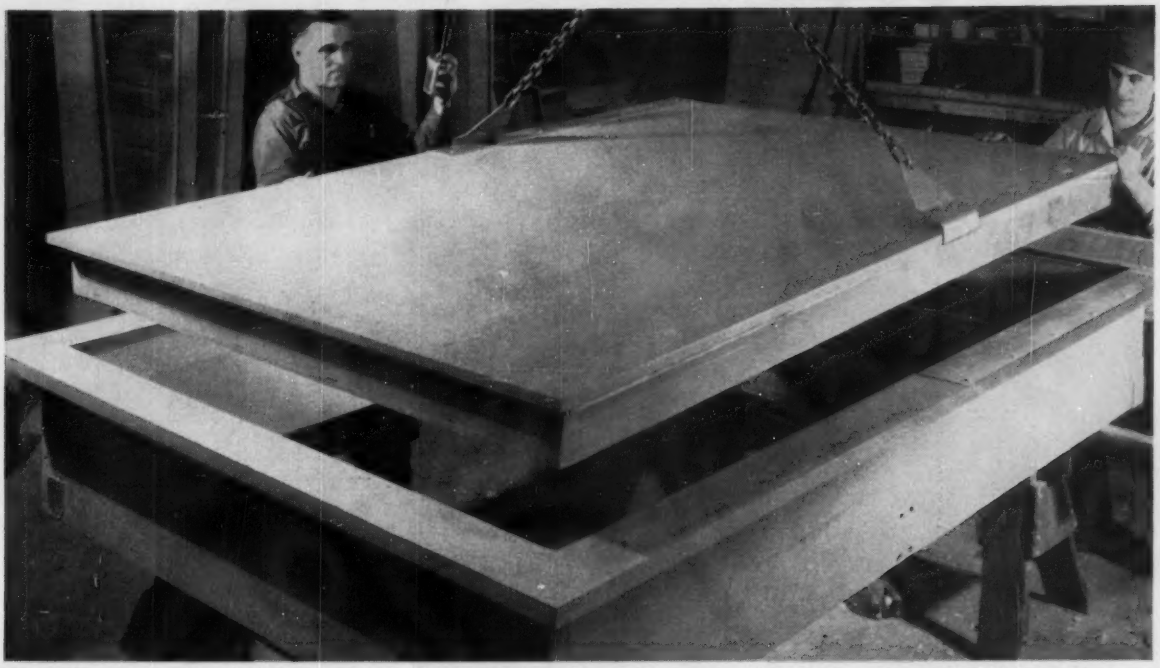
Product (Seel-Peel) is being used in prepared muffin and cake mixes. Research is under way to adapt the process to lemon and grapefruit peels.—*Sunskist Growers, Ontario, Calif.* Circle 31 on Reader Service Card

Special 41 Be Corn Syrup Is Easy to Pump at 60F.

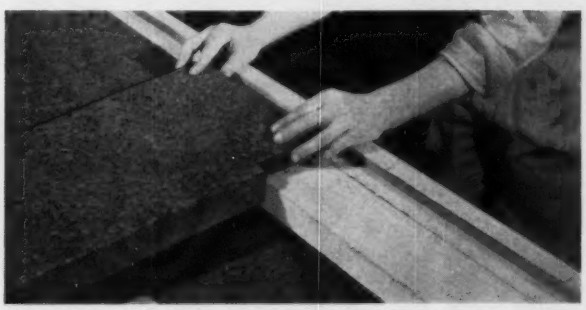
Developed for easier handling, especially by bakers, this low-viscosity corn syrup (41 Bé) can readily be pumped at 60F.

Designated No. 1612, it reportedly eliminates many problems in pulling dough at 78-80 F. Rise in

Inside and out... Jamison cold storage doors show *quality* construction



Box girder construction of highest quality boat hull plywood gives maximum strength and rigidity. Large series "50" door is shown as door and frame meet on assembly line.



Insulation—Each block of insulation is individually measured and cut to give maximum insulation efficiency.

Materials and workmanship assure top efficiency in rugged service

The reason behind the reputation of the Jamison Series "50" Cold Storage Door is apparent here. Some of the most important parts and components are never seen by customers . . . Yet operational efficiency in all types of installations continues to prove that Jamison quality materials and precision workmanship mean superior protection and overall economy.

If you have plans for modernization or expanding, first get the story on Jamison's Series "50" Door. Write for your copy of Section 3. Jamison Cold Storage Door Co., Hagerstown, Md.

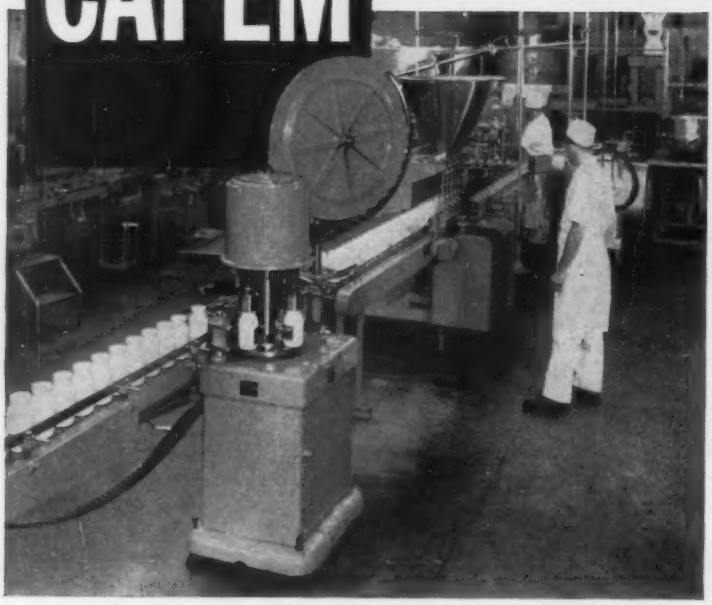
Tight Seal is assured by carefully applied gasketing. Gasket is soft sponge rubber resistant to acids, oils and greases.

JAMISON

COLD STORAGE DOORS

Jamison Cold Storage Door Co., Hagerstown, Md.

CUT CAPPING COSTS WITH CAPEM



PFEIFFER FOOD PRODUCTS, INC. recently installed this new mayonnaise and salad dressing line in their Buffalo, N. Y. plant. They chose a CaPeM, Model C-4-F for the capping operation.

This capper applies 7200 caps per hour and handles jar sizes from 6 oz. to quarts. It incorporates a special Consolidated chuck-arresting device which prevents the chuck from dropping over the jar if no cap is present. No mayonnaise ever gets on the chuck.

There are more CaPeM Screw Cappers in use than any other make. Users select them because they combine low initial cost, low operating cost, and a minimum of maintenance.

CaPeM applies any standard cap or cover and many special types at speeds ranging from 2,000 to 10,000 per hour. It handles bottles, jars, cans or jugs of any size or shape. It delivers a perfect LEAKPROOF seal.

For recommendations on improving your own capping operation, write Sales Manager, Consolidated Packaging Machinery Corp., 1400 West Avenue, Buffalo 13, N.Y.

CAPEM → **THE MODERN SCREW CAPPER**

dough temperature during mixing must be controlled by refrigeration. And heating of viscous sweetener to about 100F. so it can be pumped complicates the problem.

However, use of the new free-flowing syrup eliminates heating and possible darkening, also saves on re-refrigeration costs.—*Corn Products Sales Co., 17 Battery Pl., New York City.* Circle 32 on Reader Service Card

Water-Soluble Preservative Has Wide Application

A water-soluble benzoate complex, this preservative offers increased protection for a variety of items—jams, jellies, preserves, pickles, carbonated beverages, citrus oils and reconstituted juices, salted fish, and smoked meats.

Known as Foregard, it is a neutral, odorless powder that does not affect taste or color of treated foods. Product has FDA approval for use in foods at concentrations up to 0.1%, where preservatives are permitted by law.

In tests, commercial lime juice with 0.1% preservative was held for 15 days at room temperature without decomposition. — *Guardian Chemical Corp., 38-15 30th St., Long Island City, N. Y.*

Circle 33 on Reader Service Card

CHEMICALS

Spot-Label Glue Effective On Hot, Cold Containers

With use of this hot-melt label glue, temperature of cans or glass may range 40-160F. without causing cleaning and refilling of gum pot.

Known as No. 144, product also is said to perform well as a regular hot pickup gum. It gives a permanent bond at packaging speeds of 500 per min.— *Morningstar-Paisley, Inc., 630 W. 51st., New York City.*

Circle 34 on Reader Service Card

Non-Corrosive Compound Rapidly Thaws Snow

Designed to thaw ice and snow by freezing-point depression without generating heat, this melting compound is said to be harmless to cement, concrete, and asphalts. In addition, it does not corrode metals.

For more data, circle 344 on Reader Service Card

For more data, circle 345 on Reader Service Card →

ATLAS certified colors

Industry's Standard for Over 100 Years

FIRST PRODUCERS OF CERTIFIED COLORS

H. KOHNSTAMM & COMPANY Inc.

ESTABLISHED 1851

89 PARK PLACE NEW YORK 7 · 11-13 E. ILLINOIS ST. CHICAGO 11 · 2632 E. 54 ST. HUNTINGTON PK. CALIF.

BRANCHES IN OTHER PRINCIPAL CITIES OF THE U.S.A. AND THROUGHOUT THE WORLD

Cambridge WIRE MESH BELTS

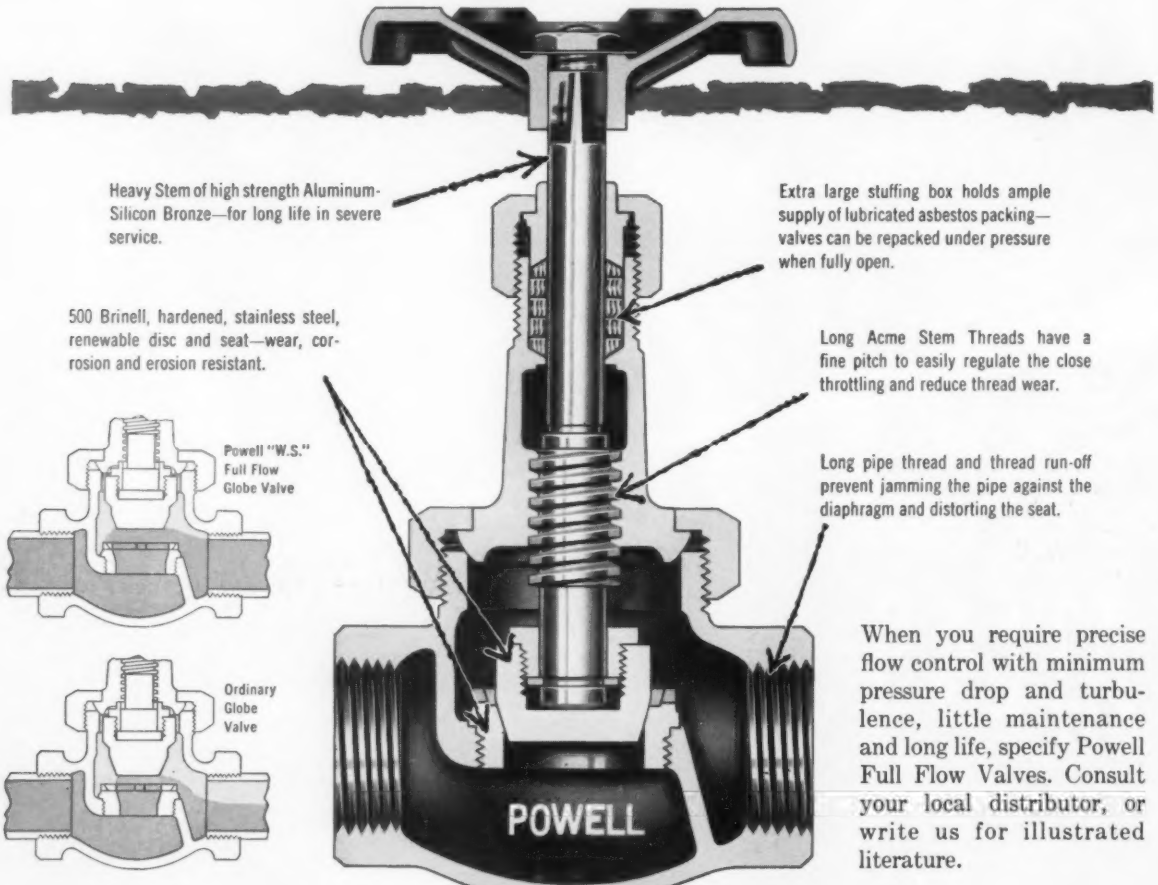
BULLETIN!

POWELL introduces new member in world's largest family of valves

Powell engineered "Full Flow" bronze valves are now available in a full line: the brand-new 150-pound screwed end Globe Valve, in addition to the well-known 200-300 pound Screwed and the 150-300 pound Flanged Globe and Angle Valves.

Although designed by Powell to assure maximum flow with minimum pressure drop and internal turbulence, these valves can be throttled to permit only the minutest amount of fluid to pass through. And, if desired, they can be supplied with Indicator Collar, Arm and V-port Disc for quickly determining flow and holding it constant.

Compare these advantages of Powell Full Flow valves:


Heavy Stem of high strength Aluminum-Silicon Bronze—for long life in severe service.
Extra large stuffing box holds ample supply of lubricated asbestos packing—valves can be repacked under pressure when fully open.
500 Brinell, hardened, stainless steel, renewable disc and seat—wear, corrosion and erosion resistant.
Long Acme Stem Threads have a fine pitch to easily regulate the close throttling and reduce thread wear.
Long pipe thread and thread run-off prevent jamming the pipe against the diaphragm and distorting the seat.
Powell "W.S." Full Flow Globe Valve
Ordinary Globe Valve
POWELL

When you require precise flow control with minimum pressure drop and turbulence, little maintenance and long life, specify Powell Full Flow Valves. Consult your local distributor, or write us for illustrated literature.

Fig. 2600 (Sectional)—150-pound "W.S." Full Flow Globe Valve, Screwed Ends

THE WM. POWELL COMPANY • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**

Called "Melt-NC", product is 99.99% chemically active but contains no calcium or chloride. Reportedly more effective than salt at lower temperatures, it leaves no residue and is non-hygroscopic. Available in 100-, 300-, and 500-lb. containers. — *Chem Industrial Co., Brooklyn, Ohio.*

Circle 35 on Reader Service Card

Hand-Sanding Simplified With New Abrasive

Easier sanding and polishing of food-plant surfaces and equipment is reported with use of a new coated abrasive paper.

Product (No Load) is termed easier to use because it requires no hand pressure and will not slip during sanding. It may be used on almost any surface, and residues can easily be removed by tapping the paper. — *Armour & Co., Coated Abrasives Div., Alliance, Ohio.*

Circle 36 on Reader Service Card

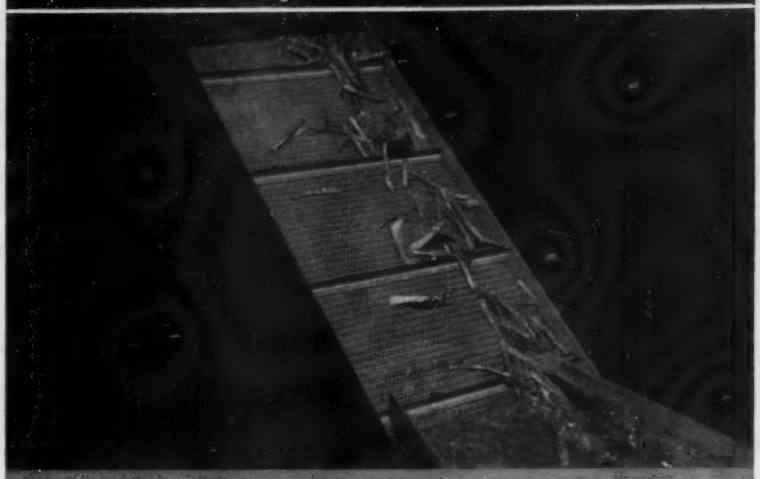
BRIEFS

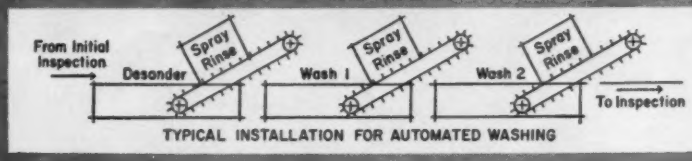
Cold/Hot Milk Separator handles 5,000 lb. per hr. at 40F. and 15,000 per hr. at 90F., skimming to 0.01% or less by Babcock test. Low pressure drop through unit lengthens seal life and permits use of a lower-horsepower feed pump. Machine can be kept running while changing from hot to cold separation.—*De Laval Separator Co., Poughkeepsie, N. Y.* (37)

Portion-Control Machine, initially developed for fish processing, automatically sorts conveyed frozen foods into 6 weight groups ranging 4-10 oz. Handling 2,700 pieces per hr., it is accurate to a fraction of an ounce.—*National Poultry Equipment Co., 615 Wells St., No., Renton, Wash.* (38)

Tankless Plate Filters (capacities to 369 sq. ft. filter surface) offer lower initial cost and labor savings in assemblying and disassembling. Leakage is eliminated by use of tie rods for clamping and having plastic-impregnated edges on filter media. Horizontal units (Model TL) are available in mild steel, stainless steel, and aluminum. Standard operating pressure is 150 psi.—*Sparkler Mfg. Co., Mundelein, Ill.* (39)

Cambridge WIRE MESH BELTS





TYPICAL INSTALLATION FOR AUTOMATED WASHING

METAL-MESH BELTS PROTECT FLAVOR, QUALITY IN CONTINUOUS PROCESSING

Continuous washing, blanching, freezing and packaging on Cambridge Wire Mesh Belts give you more uniform, high quality products, help protect food flavor and taste appeal. All-metal belts can't rust, rot, or absorb odors; can't contaminate foods. Wire mesh is cleaned quickly and thoroughly with steam or spray rinse. In baking, cooking, cooling and inspection operations, too, Cambridge Belts help increase production and reduce manual handling. Here's how:

CONTINUOUSLY MOVING BELTS ELIMINATE BATCH PROCESSING—help maintain capacity production and lower operating costs.

OPEN MESH PERMITS FREE CIRCULATION—air or process solutions pass freely through the belt for uniform processing or flash drainage of solution.

ENDLESS MESH BELT GIVES LONGER SERVICE—has no seams, lacers or fasteners to break; takes up to 2100° F. or sub-zero temperatures.

SPECIAL SURFACE ATTACHMENTS AVAILABLE—raised edges or cross flights to hold product on belt during movement.

Talk to your Cambridge FIELD ENGINEER soon—he'll explain the many advantages of continuous food processing on Cambridge Wire Mesh Belts. He'll recommend the belt size, mesh or weave—and the metal or alloy—best suited to your operations. You'll find his name in the classified phone book. Or, write for FREE 130-PAGE REFERENCE MANUAL giving mesh specifications, design information and metallurgical data.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

Department Q, Cambridge 10, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

For more data, circle 347 on Reader Service Card

Best way to Increase Flavor, Texture and Value

Food processors have long relied upon the quality ingredients distributed to the food industry by Corn Products Sales Company: Cerelose dextrose sugar; Buffalo, Hudson River and Snowflake starches; Rex and Globe corn syrups. These fine products bolster the flavor, texture and color of fine foods—factors that enhance food value and keep buyers reaching for your brand.

The sugars, syrups and starches available from Corn Products Sales Company do more than increase these desirable food qualities: they save on production costs as well. These *natural* products are easy to handle, lead to more efficient, economical processing. Their carefully controlled quality, uniform from day-to-day, means your formulations can be consistent and standardized.

The experience amassed by our technical representatives in incorporating Corn Products sugars, syrups and starches in virtually every type of fine food product sold today, is always at your service. For full information on how these quality-enhancing ingredients can be adapted to your processing, call our nearest sales office or write direct.

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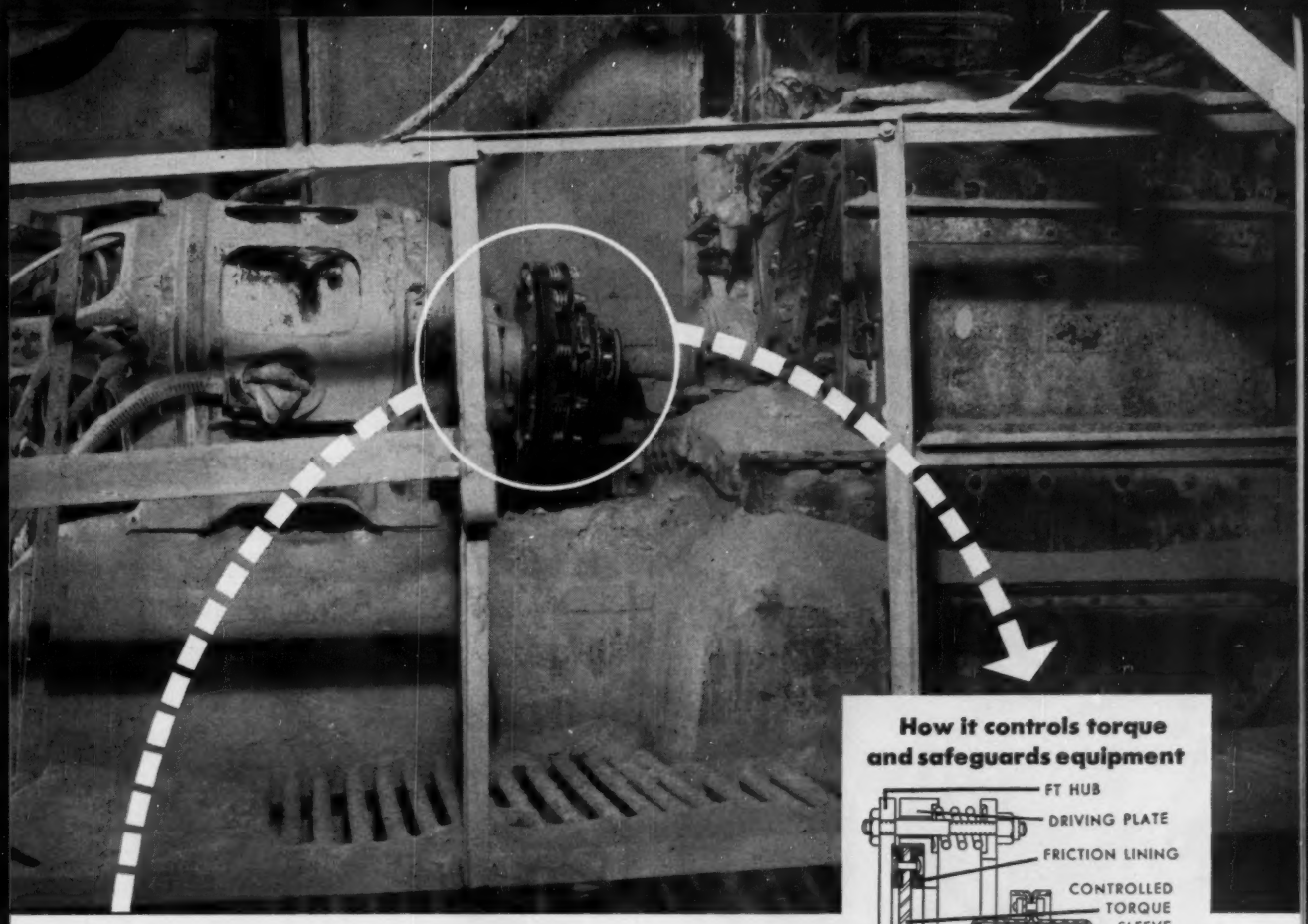
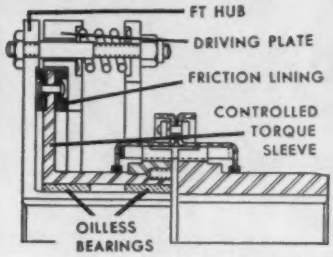


How it controls torque and safeguards equipment



Protect machines from overload damage with FALK Controlled Torque Couplings

The above picture shows a Falk Controlled Torque Coupling connecting a 150 hp motor to a hammermill. Formerly, when tramp iron got into the mill, it was necessary to rewind the motor at least twice a year. But, in the 2½ years after installing a Falk Controlled Torque Coupling, no motor repairs were required. *That is real saving!*

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Here (as in photo), the torque-control hub is shown mounted on driving shaft. From this hub, power is transmitted through friction lining to controlled torque sleeve. Load to be transmitted is determined by the (pre-set) pressure on friction lining. In case of overload, this hub still rotates until power is shut off—but the rest of the coupling and the driven machine will slow down or stop.

Motor Shut-off Control

By adding an automatic cut-out switch with V-belt connection to driven shaft, motor can be stopped immediately. With the standard hub mounted on driven shaft, the switch opens the electric circuit when speed of switch falls below predetermined value.

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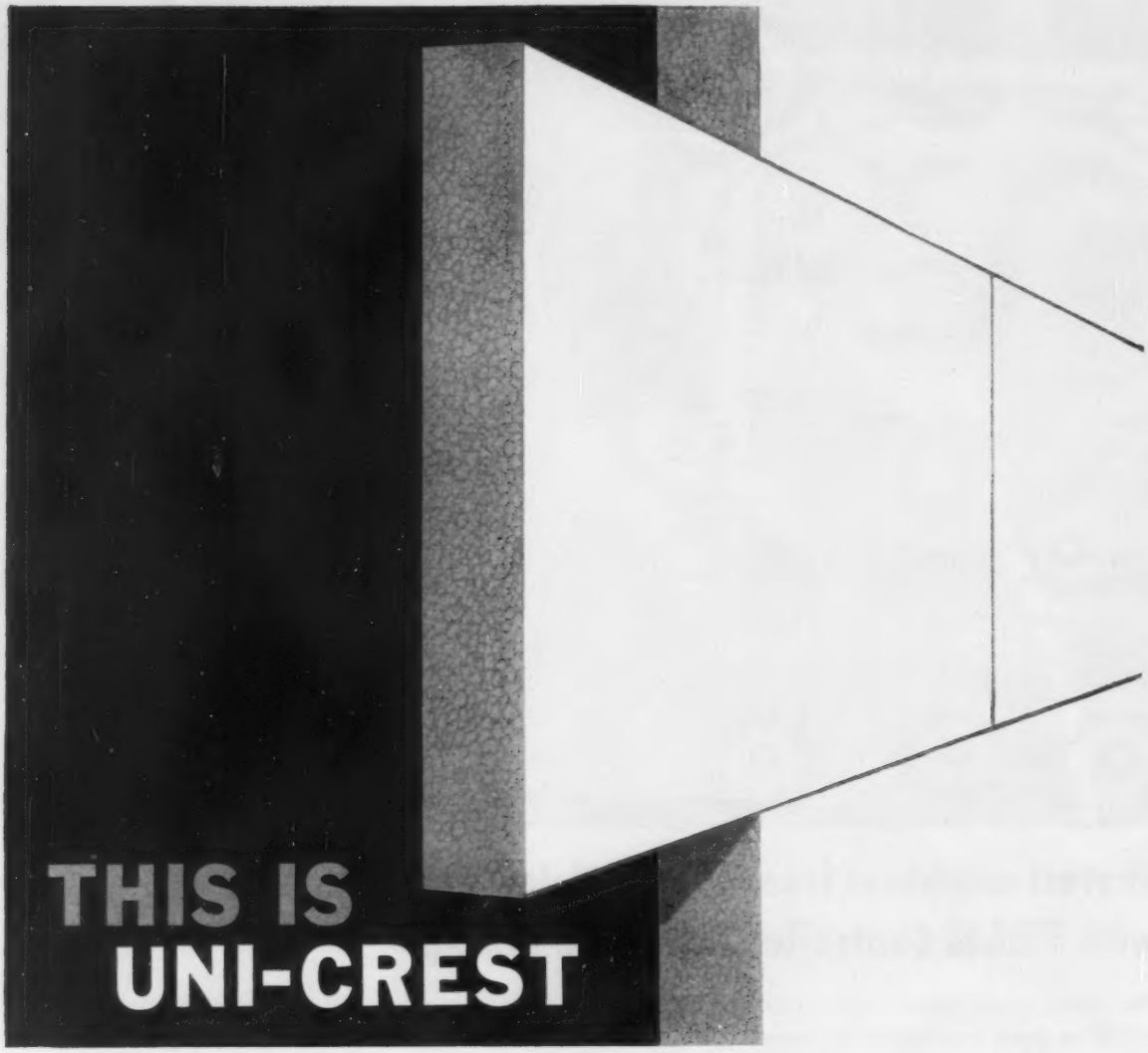

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Industrial Controls. Details over 9,000 pneumatic, electric and electronic devices for control, switching, or safety functions.—Minneapolis-Honeywell Reg. Co., Philadelphia. (68)

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Deaerating Heater. Details 2-stage, spray-type packaged unit with stainless internal vent condenser, controls and valves in capacities 2,800-100,000 lb./hr. 6p.—Graver Water Conditioning Co., N. Y. C. (72)

Industrial Fans with capacities 1,000-30,000 cfm. Contains selection data, capacity tables, dimensions, etc. 16p. —The Day Sales Co., Minneapolis. (73)

Food Processing Equipment. Contains illustrations, specifications, design data on evaporators and condensers, dryers, flakers and cooling drums, autoclaves, mixers, kettles. etc. 24p.—Buflovak Div., Blaw-Knox Co., Buffalo, N. Y. (74)

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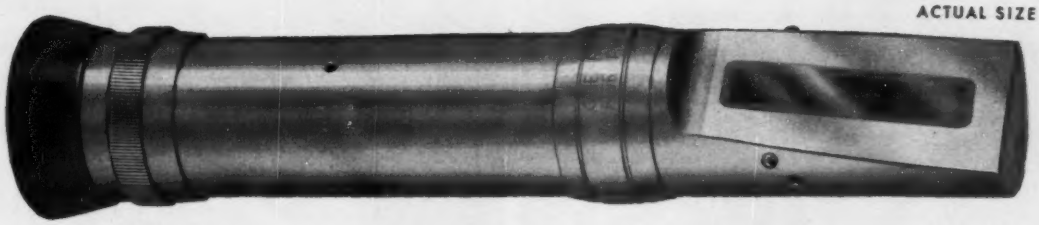

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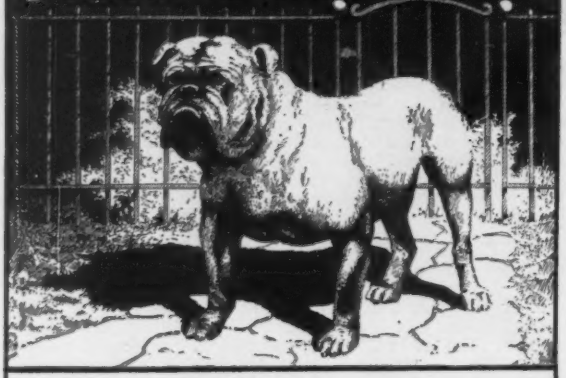

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Vaccum Pumps with larger capacities, increased efficiencies, more compact design detailed. 2p.—F. J. Stokes Corp., Philadelphia. (86)

Rotary Blowers, gas and vacuum pumps to handle 1,000-20,000 cfm. at pressures and vacuums up to 10 psig. single stage, greater pressures double-stage. Details construction, typical uses. 20p.—Sutorbilt Corp., Compton, Calif. (87)

Cooling Coils both DE and water described and illustrated. Contains construction specifications, dimensions, surface charts, circuiting diagrams, capacity tables, etc. 50p.—Amer. Air Filter Co., Louisville, Ky. (88)

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Rotary Drum Filters, their components and accessories. 24p. — Dorr - Oliver, Inc., Stamford, Conn. (89)

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Expellers for vegetable oil extraction. Details process, twin motor principle, itemizes capacities, residuals, shipping weights. 12p.—V. D. Anderson Co., Cleveland. (92)

Magnetic Flowmeter employs electromagnetic induction to produce a.c. signal proportional to flow rate. 4p.—Fischer & Porter Co., Hatboro, Pa. (93)

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Blast Freezing Systems for ice cream, pies, fish sticks, meat, bakery products. 4p. —J. W. Greer Co., Wilmington, Mass. (95)

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Cracked Corn Grinder, its construction and design details. 2p—Sprout, Waldron & Co., Muncy, Pa. (103)

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MATERIALS HANDLING

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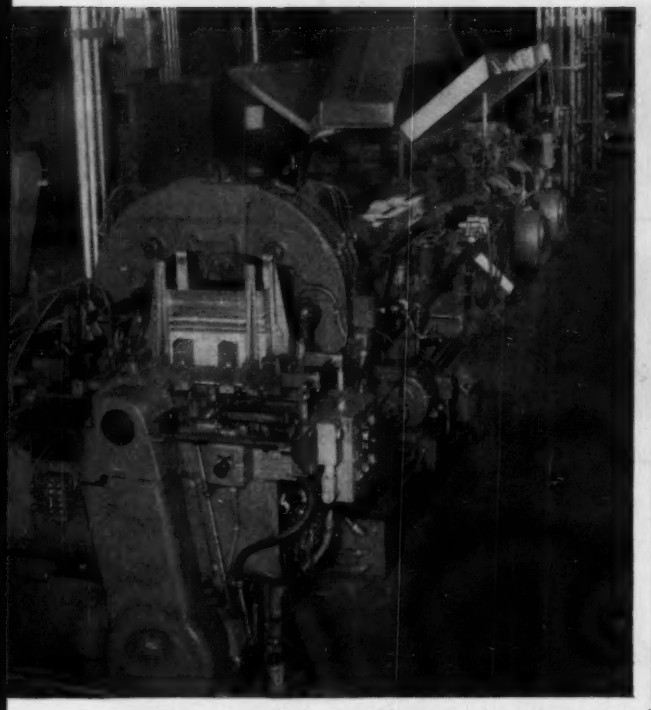
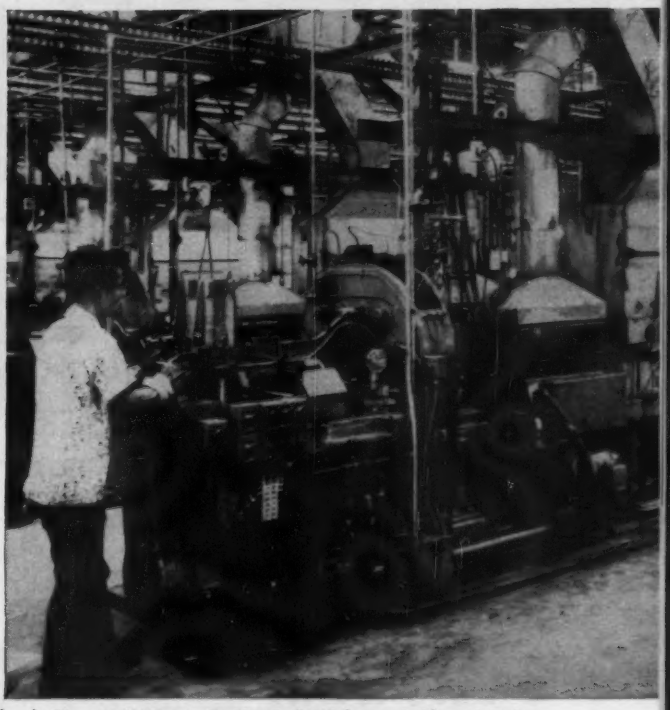
Hamilton new bodymakers are in service at many well-known plants





Installations pictured above, Hershey Chocolate, Hershey, Pa. (top); Sherwin-Williams, Oakland, Calif. (lower left); and Dole Pineapple, Honolulu, indicate how leading packers have chosen Hamilton's new Bodymaker to meet can requirements efficiently.

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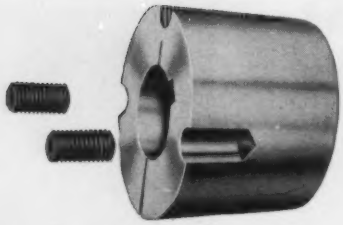

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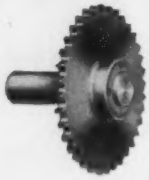
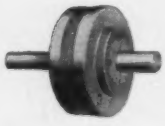
Change from shaft to shaft				
Change from size to size				
Change from sheaves to sprockets to couplings to conveyor pulleys				

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You save big money by minimizing down-time with *quick* changes. And interchangeability minimizes inventory. Note that all of the above installations are handled with a total of only four bushings—all with the same outside diameter!

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Single-Pan Balances described with illustrations. Explains theory of substitution-type weighing. 12p.—Fisher Scientific Co., Pittsburgh. (130)

Laboratory Equipment catalog. 20 p.—Schaar & Co., Chicago. (131)

Temperature Control in gas and vapor chromatography detailed. 8p.—Burrell Corp., Pittsburgh. (132)

Nonaqueous Titrations with speed, simplicity and little equipment is subject of data sheet.—Beckman/Scientific Div., Fullerton, Calif. (133)

INSTRUMENTS

Turbine Flowmeter specification sheet. 4p. Fischer & Porter Co., Hatboro, Pa. (134)

Resistance Thermometers for temperatures to 1,000F.,

That frost is lost refrigeration

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1. **Protects your compressor** — eliminates damage from slugs of liquid in the compressor chamber, cause of broken rods, broken heads, diluted lubrication, unnecessary wear.

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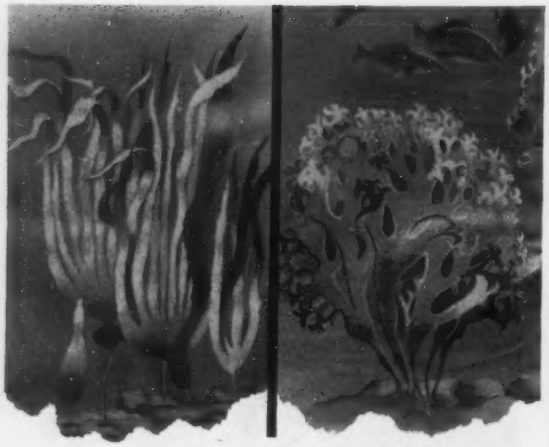

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Level Control for bins that actuates feeding equipment to maintain desired quantity of material. 2p.—Convair, Pittsburgh. (145)

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Cellulose Bander for bottles and wide-mouth jars operates at up to 210 per min. 4p.—John Burton Mch. Corp., Concord, Calif. (147)

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Heat Sealers, labelers, belt conveyors detailed in 10-section file.—Doughboy Industries, Inc., New Richmond, Wis. (150)

Polyethylene Films, coatings and molded items for packaging.—U. S. Industrial Chemical Co., N.Y.C. (151)

MANAGEMENT

How Tags Move Merchandise details "system" and "information" tags, with basic requirements, size, component, color and copy. 4p.—Tag Mfg. Inst., N.Y.C. (152)

Alloy Fabrication. Describes with photos and sketches, fabrication techniques employed in production of both standard and complex equipment. 30p.—S. Blickman, Inc., Weehawken, N.J. (153)

Biology & Business. How biological evaluation can be used in food industry. 12p.—Foster D. Snell, Inc., N.Y.C. (154)

High Alloy Castings. Details manufacturing facilities and quality control procedures utilized in production of commercial castings, valves, and fittings. 16p.—Cooper Alloy Corp., Hillside, N. J. (155)

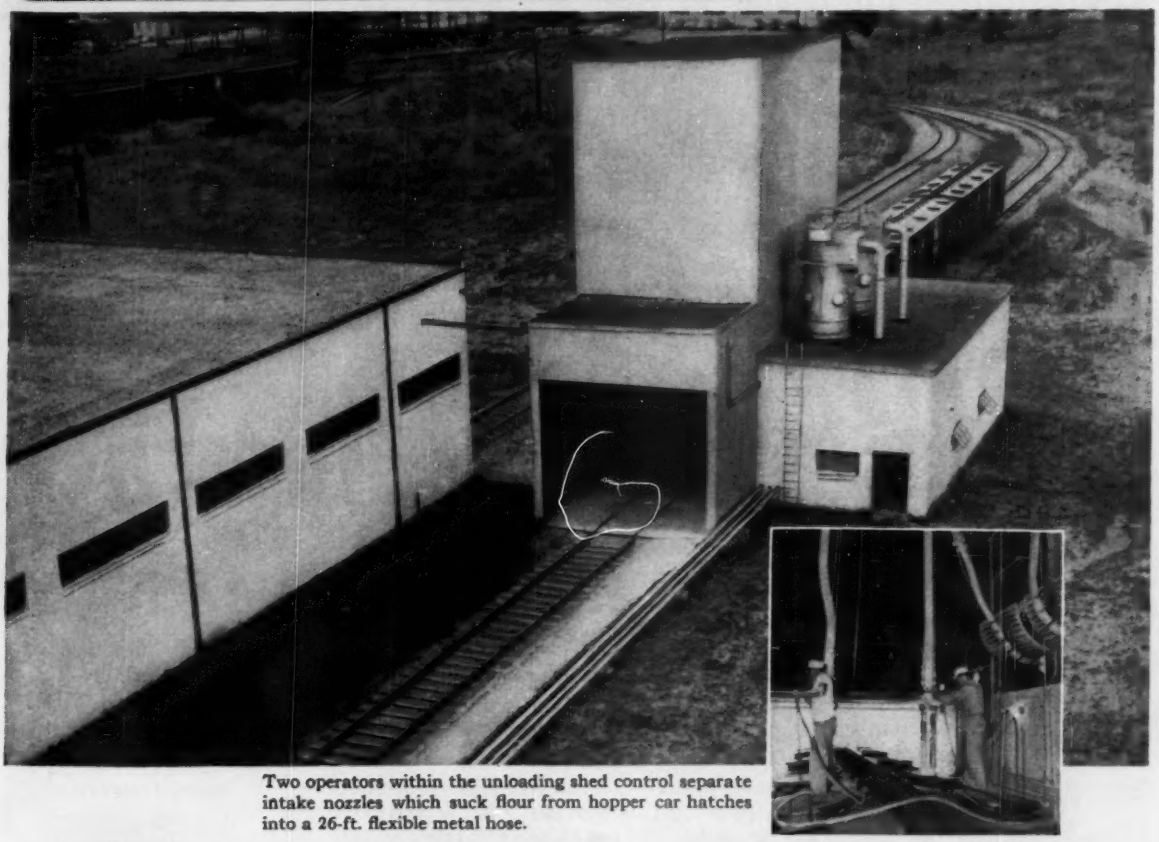
Diversified Products. Describes company's line of equipment for food field, its manufacturing setup and personnel. 24p.—Fischer & Porter Co., Hatboro, Pa. (156)

Data Processing System capable of receiving 1,000 input signals at high speed, converting them to digits, putting information on magnetic tape suitable for any computer. 6p.—Beckman Systems Div., Anaheim, Calif. (157)

Merchandising With Corrugated details wide range of boxes, display shippers, and stands. 4p.—Gaylord Container Corp., St. Louis. (158)

Custom Built Stainless Equipment. Illustrates facilities available and products being engineered and fabricated by company. 36p.—Paul Mueller Co., Springfield, Mo. (159)

The Arithmetic of Materials Handling



Two operators within the unloading shed control separate intake nozzles which suck flour from hopper car hatches into a 26-ft. flexible metal hose.

Flexibility of FULLER Pneumatic Conveying Systems Makes Problem Plant Site Practical For General Mills

The proposed site of a new General Mills flour blending and packaging plant in Louisville, Ky. seemed impractical to mill engineers because of the site's long, narrow shape. Flour, delivered at a dead-end rail siding, would have to be conveyed over unusually long distances—400 feet from unloading point to storage bins.

By incorporating Fuller Airveyor® pneumatic conveying systems in the plant design, General Mills has overcome these disadvantages and has completed one of the country's most modern bulk flour handling plants.

At the new, highly-automated plant, Fuller Airveyors unload Airslide® or hopper cars of bulk flour at 40 tons an hour, flowing it 400 feet to a series of 18 silos. In a completely integrated system, other Fuller Airveyors deliver ingredients for blending, weighing, proportioning and bagging operations. The compact, 5-inch pneumatic pipelines twist and turn easily through what would be cramped or impossible quarters for other methods of conveying. Self-cleaning Airveyors, containing few moving parts, practically eliminate maintenance and industrial hazards.

Production speed, flexibility, sanitation, processing accuracy, push-button control of an entire plant—are just some of the advantages of Fuller pneumatic bulk handling systems realized at General Mills' new Louisville plant. Similar advantages can apply to old plants modernized with the help of Fuller engineering specialists. Write or phone today outlining your problem. Fuller will gladly furnish additional information with appropriate recommendations. 1187 A-269

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....pioneers in harnessing AIR

in bulk handling...

TOTE SYSTEM*

offers GREATEST in-plant or inter-plant FLEXIBILITY

This is one of Tote's many food installations in which five Tote Bins discharge into a pneumatic conveyor which carries the bulk material to a weigh hopper, from where it is discharged into a blender.

Tote – *a complete, mechanical, automatic bulk handling system* – is based on metal bins (aluminum, stainless or carbon steel, monel or magnesium) plus filling and discharging equipment. From start to finish in your bulk material handling, Tote provides unequalled flexibility. Here's how:

IN TRANSPORTATION...

Tote Bins can be shipped between your supplier and your plant—or between your own plants – by rail or truck. Or Tote Bins can be left in your plant and filled from hopper cars or trucks. The sealed bins absolutely protect product quality.

IN WAREHOUSING...

Tote Bins will save up to 15 per cent of the warehouse space usually required for bagged material – without double-decking – and up to 30 per cent when compared with horizontal storage bins. If ceiling height permits, Tote Bins can be high piled. And they can be stored outside if necessary because they are weather-tight.

IN PROCESSING, MIXING and PACKAGING OPERATIONS...

Tote System has proved to be the ideal answer for a wide variety of in-plant handling problems. It can be – and is being – used as temporary storage during laboratory tests; in automatic weighing, blending and packaging operations; and as a "bridge" between production and packaging departments. Tote permits the use of a minimum, uncomplicated conveying system. And only Tote permits you to weigh incoming material as a check against invoice weight and for a permanent inventory record.

IN PLANT LAYOUT...

With Tote, you can easily meet changing conditions. Plant layouts can be easily changed by re-locating discharge stations. Bins can be used interchangeably for different products. Operations can be easily expanded by adding Bins.

AND... Tote meets the requirements of all existing sanitation codes.

Why not let Tote Engineers survey your plant at no obligation? Meanwhile, write for new illustrated catalog for more details

TOTE SYSTEM, INC.

690 SO. 7th BEATRICE, NEBRASKA

*Tote and Tote System Reg. U. S. Pat. Off.

BEST KNOWN NAMES IN FOOD EMPLOY TOTE SYSTEMS

This is only a partial listing of the food processors that have installed Tote Systems.

CEREAL PRODUCTS
General Mills

COCOA POWDER
National Biscuit Company

DESSERT
General Foods Corp.
Kind & Knox
Thomas J. Lipton Co.

DRY MILK
Borden Co.
Carnation Co.
Nestle Co.

FLOUR
Campbell Soup Co.
Continental Baking Co.
General Mills
Interstate Bakeries, Inc.
National Biscuit Co.
Pillsbury Mills
Sunshine Biscuits, Inc.

SOLUBLE COFFEE
Borden Co.
J. A. Folger & Co.
General Foods Corp.
Hills Brothers
Nestle Co.
Standard Brands, Inc.

SUGAR
American Chicle Co.
Campbell Soup Co.
General Foods Corp.
General Mills
Pillsbury Mills
Sunshine Biscuits, Inc.

Keep Your Product on the Move

Oil, vinegar, spice flavors—
and clear as a choice Rhine wine

You would know better than we whether there is any future in this idea.

The cruet contains 10% of water. It might have been vinegar. The rest is oil. Half of the oil is the usual triglyceride salad oil. The other half of the oil is distilled monoglyceride. It is equally wholesome food. The monoglyceride dissolves both the conventional salad oil and the water. This clear, uniform, stable solution can carry both oil-soluble and water-soluble condiments and flavor extracts.

It would be interesting to experiment with other ratios of triglyceride to monoglyceride. This is for food processors to do, not for us. Our business is making Myverol® Distilled Monoglycerides so pure they can give this effect. We shall be delighted to supply food processing firms with free samples for their experiments. ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York, Chicago, and Memphis • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

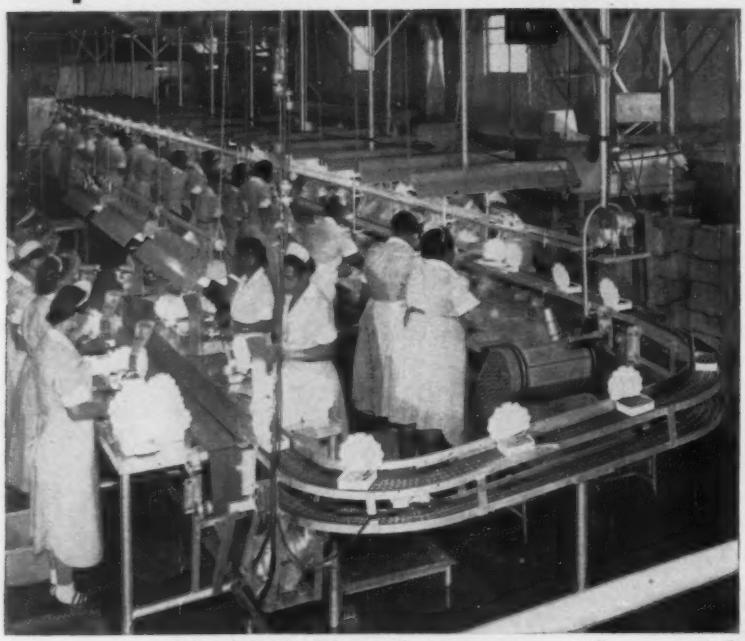
distillers of
monoglycerides made from natural fats and oils

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

Keep Your Product on the Move



Ashworth Omniflex Belt carries frozen asparagus . . . rapidly . . . economically

with ASHWORTH METAL PROCESS BELTS

Whether it is baking, deep frying, quick freezing, cooling or any other process operation, you can keep your product on the move better with a belt designed to the specific job.

Fabricated from any metal capable of being formed into wire, Ashworth Belts provide a conveying medium permitting processing in transit through temperatures from −50° to 2100° F. Wherever your product must go during processing, be sure to get the "right" belt for the job . . . consult an Ashworth engineer.

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Lease or purchase?

If this is the question you are having difficulty in answering, you may find a key to the solution in a report to be published this month.

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The latest in the publisher's series of consultant reports on current business problems, the report costs $15 (or $12.50 by subscription). Authors are Harvey Greenfield, a New York City attorney, and Frank Griesinger, assistant treasurer of the Lincoln Electric Co., Cleveland.

For some new and sharp thinking on the problem of leasing versus buying, this is your guide.

Guides to Modernization

REALISTIC DEPRECIATION POLICY *by George Terborgh. Published by Machinery and Allied Products Inst., 1200 Eighteenth St., N. W., Washington 6, D. C. Price:* $6.50. Penetrating analysis of the course of capital consumption in relation to asset life.

PLANNING AHEAD FOR PROFIT *Published by American Management Assn., 1515 Broadway, New York City 36. Price:* $4.50. Prospects and programs for corporate growth.

TOWARD THE FACTORY OF THE FUTURE *(Special Report No. 28). Published by American Management Assn., 1515 Broadway, New York City 36. Price:* $2.50. Papers presented by leading industrial figures at AMA Manufacturing Conference.

BUILDING FOR INDUSTRY *Published by F. W. Dodge Corp., 119 W. 40th St., New York City 18. Price:* $9.75. Architechtural studies of 74 new industrial buildings indicate combination of functional and attractive values.

Reading for Food Men

BIBLIOGRPHY OF FOOD. *By E. Allen Baker, and D. J. Foskett. Published by Academic Press, Inc., 111 Fifth Ave., New York City, 3. 1958. 331 pages. Price:* $11.

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CARNATION COMPANY'S freezer box in Los Angeles plant is mounted outdoors on a concrete slab with Armorply ceilings and walls. Armorply's metal faces over Weldwood waterproof plywood reflect away sun's heat, have high impact strength, need virtually no maintenance, and afford vapor- and verminproof protection for ice cream.

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Freezer rooms made of strong metal-faced plywood panels called Armorply can be assembled – or dismantled and moved, as market conditions require – quickly and easily. As manufactured by Annapolis Yacht Yard, Freezer Box Division, Annapolis, Md., standard-size modular panels faced with Armorply have a patented joint-locking device that eliminates sealing problems. Temperatures can be maintained down to –100° F. Armorply rooms can be added indoors or outdoors, require only a protective roof.

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Packomatic equipment feeds, forms, positions, loads, seals and imprints corrugated shipping containers automatically. However you ship—in multi-ply paper bags, or in corrugated shipping containers; whatever you "package"—a can, a carton, a box or a bale—there's a Packomatic machine designed to handle your shipping container requirements. Packomatic machines, geared to your production line, will feed, form, position, load, seal and imprint corrugated containers automatically—or do any of these operations singly as a complement to your existing packaging facilities. Let one of our sales engineers suggest the start of a long-range packaging program for your plant. Investigate the Packomatic method of cutting costs and boosting production. Call, write or wire today.

Fully-automatic Packomatic Case Former-Loader, part of a fully-automated production line at the Simoniz plant, Kankakee, Illinois. Other Packomatics on the Simoniz line include Case Sealers and Case Imprinters.

Begin to automate your packaging line with this high-speed, fully-automatic Case Sealer. Aligns loaded cases, positions flaps, glues, seals and discharges—and no operator needed! Available in wide range of sizes. Semi-automatic, too. Call or write for additional information.

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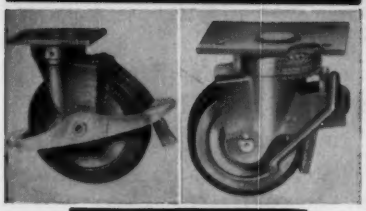

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Food Processing Plants are turning to Darnell Brake Casters for ease of equipment operation and lasting economies. Darnell distributors provide them with one of America's most complete lines.

Available in hundreds of models —select the types best suited to your particular requirements. Various types of treads (including Neoprene and Phenolic Wheels) and a variety of stems, top-plates and other fittings for ease of application to all movable food processing equipment.

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raphy of nutrition food and beverage technology and distribution covers the period from 1936 to 1956. Of specific interest to the food economist and food scientist, the reference includes only published material.

For Reference or Text

COMMERCIAL FOOD AND VEGETABLE PRODUCTS. (4th Edition). *By W .V. Cruess. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York City 36. 884 pages. 1958. Price:* $15.

Designed primarily as a text book for college lecture courses, this book can also serve as a useful reference on principles and production methods for canners, freezers, juice producers, preservers, and other food processors.

Based on lectures given by the author over the past 40 years, the book places equal emphasis on application as well as formula. Attention is centered principally upon those industries directly affecting the fruit and vegetable grower rather than the producers of field crops and live stocks. Descriptions of new technique in the sealing and processing of cans and the sterilization of cans and glass-packed foods by heat has been included.

New materials in this 4th Edition include aseptic canning, steam flow closure of cans, liquid sugar, new products from surplus, sterilization by irradation, high temperature—short-time sterilization, low temperature vacuum concentration of fruit juices, and the reuse of water in canneries.

New FDA Reference

FEDERAL FOOD, DRUG & COSMETIC ACT, 1953-1957. *Published by Commerce Clearing House, Inc., 4025 W. Peterson Ave., Chicago* 36. 1958. 1127 *pages. Price:* $25.00.

Another in the Food Law Institute series, this book is a compilation of the complete administrative and judicial record of the Federal Food, Drug & Cosmetic Act as amended from January, 1953 through December, 1957. It includes all pertinent court decisions, statements of policy and interpretation by the FDA for the period.

Also of great interest are the definitions and standards for food, sample forms to follow in filing a petition, and the full text of all important legal changes.

Accumulative tables of cases enables the reader to spot needed court decisions quickly and easily.

LUBRIPLATE No. 630-2 Multi-Purpose Grease

ALSO PACKED IN CONVENIENT GREASE GUN CARTRIDGES

Lubriplate No. 630-2 is a high temperature, extreme pressure, water-repellent, grease type lubricant. Ideal for the general lubrication of Industrial, Automotive, Construction, Farm and Marine Equipment. Lubriplate Grease Gun Cartridges provide an easy, quick, economical means of application. Prevent the waste and mess of hand filling. Packed 10 Cartridges in a handy carrying carton.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK". . . a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

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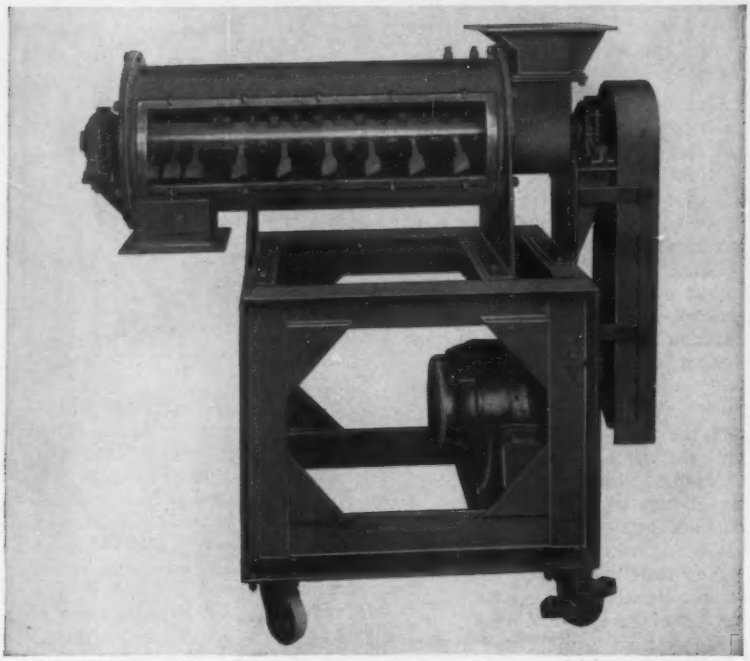
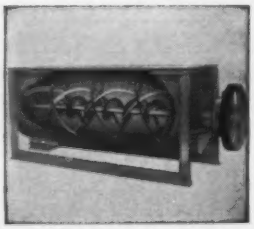
NEW PRODUCT NEWS

NEW HIGH SPEED MIXER FOR QUALITY FINISHING

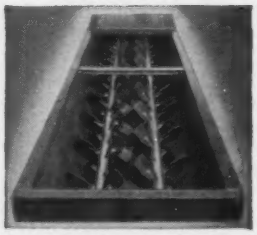


The Turbulizer produces a homogeneous mix, increases production while reducing mixing time and costs.



TRIPLE ACTION MIXER—Complete uniform blending in 2 to 7 minutes.

STRONG-SCOTT TRIPLE ACTION MIXER exposes each particle in the mixture to over 10,000 separate mixing actions per minute as it blends and folds. This produces a uniformly mixed product with 99.9% thorough distribution of minor additives.



TWIN ROTOR MIXERS—Accurate blending of liquids and dry mix at any speed.

TWIN ROTOR MIXERS are designed primarily for high percentages of liquid application to light weight ingredients, where product identity is to be maintained. A double shaft assembly with overlapping, adjustable paddles gently combine the liquids with the dry mix.

STRONG-SCOTT TURBULIZER

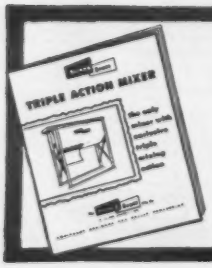
Provides Fast, Thorough Dispersion, Disintegration and Blending of Dry Materials, or Pastes Involving Liquids and Solids.

The TURBULIZER is a high speed, continuous mixer that will disintegrate and disperse fat pellets, chemical ingredients which have a tendency to ball or agglomerate, and other ingredients which can be broken by the paddles and thoroughly dispersed in the mixture. Product uniformity is accurately maintained as a result of high speed centrifugal forces created by the paddles.

It is also highly applicable where a fluffing action is desired on powdered material. Minor percentages of liquid may easily be added to dry mix with high efficiency and dispersion results.

The TURBULIZER is self cleaning and is built with sanitary seals at each end of the shaft. The interior is precision machined. Overlapping, adjustable paddles turn within a close tolerance to the chamber wall, providing a selective rate of material flow.

The TURBULIZER may be furnished in carbon or stainless steel and may be jacketed for hot water, steam or a refrigerant. Capacities will vary depending on the bulk density of the material and the degree of agglomerates encountered. Consult Strong-Scott for full details.



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For complete information on the equipment shown above, write to The Strong-Scott Mfg. Co.

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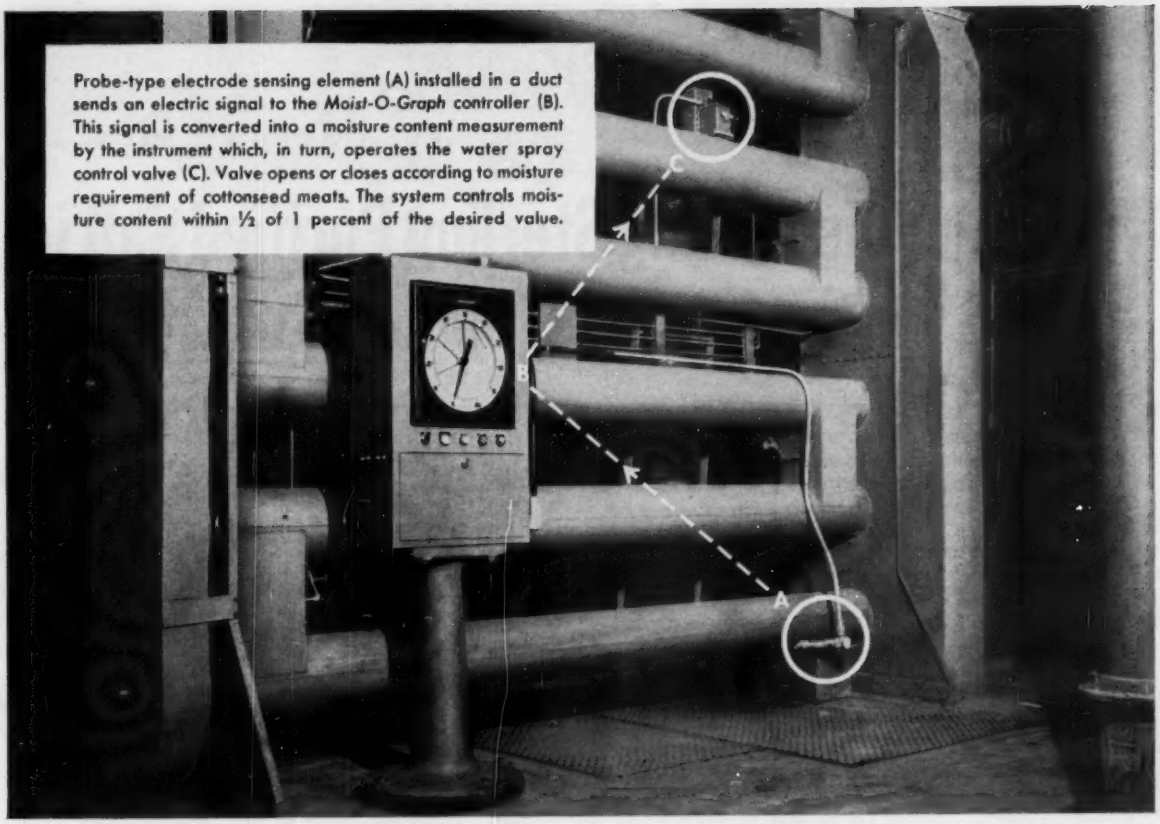

Probe-type electrode sensing element (A) installed in a duct sends an electric signal to the *Moist-O-Graph* controller (B). This signal is converted into a moisture content measurement by the instrument which, in turn, operates the water spray control valve (C). Valve opens or closes according to moisture requirement of cottonseed meats. The system controls moisture content within ½ of 1 percent of the desired value.

Products improved, costs cut . . .

by Honeywell moisture control system in cottonseed processing

Accurate moisture control is the key to profitable production of cottonseed oil and meal. J. G. Boswell Cotton Co., Litchfield Park, Arizona, keeps product quality high, saves money and increases profits with a Honeywell *Moist-O-Graph* system to measure and control moisture content of cottonseed meats before they're processed. The system has paid for itself in six months.

With accurate moisture control, many man-hours are saved in the cooking of the meats. In addition, conveyor lines are no longer clogged by overly moist meats, and don't have to be broken down for cleaning. Protein is easily maintained at desired level. Bulk weight yield is increased without risk of exceeding the legal limit for moisture content.

Your nearby Honeywell field engineer can help you gain the advantages of instrumentation in your own process. Call him today . . . he's as near as your phone.

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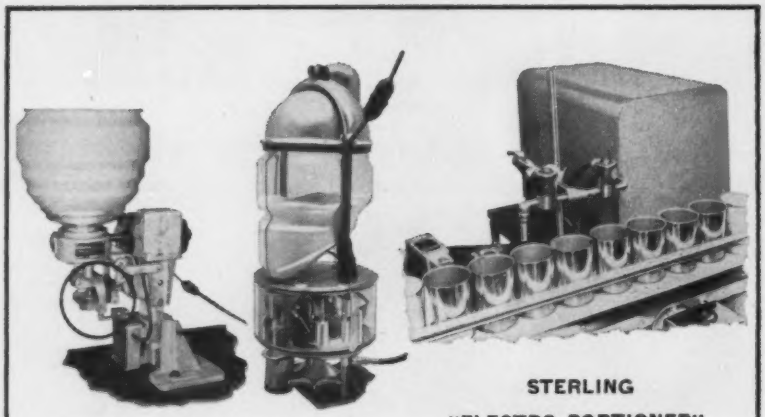
Using Salt Efficiently

by INTERNATIONAL SALT COMPANY, INC.

Dispensing Sterling Purified Salt in Brine, Tablets, Bulk—Automatically

No matter how you add salt to your product . . . International Salt Company has the dispensing equipment you need. For adding salt in brine form, International has helped develop the Sterling "Electro-Portioner" Brine Dispenser. For depositing salt tablets, the Sterling Saltomat is available. And for dispensing Sterling Purified Salt in bulk, we supply the Sterling Bulk Salt Dispenser.

All these dispensers are fully automatic, highly accurate, economical to use, and thoroughly dependable. Even more important, they can operate on today's faster-moving lines. For all these reasons, International Salt Company is now supplying salt dispensers to a growing number of canning plants.



STERLING SALTOMAT (Left) AND BULK SALT DISPENSER

STERLING "ELECTRO-PORTIONER" BRINE DISPENSER

Sterling "Electro-Portioner" Brine Dispenser. Here's a new brine dispenser that's already in use in many canneries. A main reason is its versatility: it can dispense brine, sugar, MSG, or any combination of liquids into paper, glass, and metal containers.

In addition, the Sterling "Electro-Portioner" can dispense liquids into as many as 300 cans per minute. It always dispenses the right amount, has the "no can . . . no fill" feature that prevents brine waste. And it dispenses a preset amount of liquid whenever a container trips the sensitive microswitch.

Here's what Manager John A. Mayer, Durand Canning Co., Durand, Wis., says about the Sterling "Electro-Portioner" Brine Dispenser: "Two 'Electro-Portioners' on our #303 pea-canning lines, running at about 200 cans per minute, produced a considerable saving on both salt and sugar!"

Sterling Saltomat . . . for food packers who prefer to use Sterling Purified Salt in tablet form. The Saltomat is consistently accurate even when depositing tablets at the rate of 275 cans per minute. It is equally efficient in handling tablets from 10- to 250-grain size.

Sterling Bulk Salt Dispenser. This automatic unit has been developed especially to dispense bulk Sterling Purified Salt. Dispensing salt only when a container is in the correct position, the bulk dispenser wastes no salt . . . and gives positive accuracy.

Sterling Salt Dissolvers. To make fully saturated brine automatically from Sterling Rock Salt, International Salt Company supplies the Sterling Lixator in many designs and sizes. Operating on the self-filtration principle, this unit produces crystal-clear, fully saturated brine that can be used for virtually every canning job using brine.

For canning processes that require brine made from Sterling Purified Salt, International supplies the Sterling Evaporated Salt Dissolver. Both this dissolver and the Sterling Lixator are available in steel, Monel metal, and corrosion-proof plastic.

If you'd like more information on any of this salt-dispensing and brine-making equipment, phone or write International Salt Company, Inc., Scranton 2, Pa. . . . or contact our nearest district office.

Using salt efficiently in its many industrial applications calls for technical knowledge and experience. International Salt Company has both, plus a continuing program of research and development in salt. These things can be put to work for you, in your plant, to help you get the most from the salt or brine you use.

INTERNATIONAL SALT CO., SCRANTON, PA.

Sales Offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; Memphis, Tenn.; and Richmond, Va.

IN ANY FORM . . .

Sterling Purified Salt Always Protects Flavor, Color, Texture

It's guaranteed to contain more than 99.95% sodium chloride! Whether you use Sterling Purified Salt in bulk, tablets, or brine—it never contains more than 40 parts per million combined calcium and magnesium, never more than 5 parts per million copper or iron. Downgrading of food, caused by excessive calcium or magnesium content in salt, is *eliminated.* Sterling Purified Salt meets the strict requirements for the entire canning and food-processing industry.

Service and research are the extras in **STERLING SALT**

PRODUCT OF INTERNATIONAL SALT COMPANY, INC

RECENT INVENTIONS

PRODUCTS

Milk Powder Made by Precipitating Casein From Condensed Skim Milk, Rehydrating With Alkali—Crest Foods Co., Ashton, Ill. No. 2,831,771.

Tea Concentrate Containing Leaf Extract, Edible Sulfite—Afico S.A., Lausanne, Switzerland. No. 2,831,772.

Beverage Comprising Orange Juice, Water, Macerated Pimento—C & C Super Corp., N.Y.C. No. 2,831,773.

Annatto Extracted from Seeds With Hot Alkaline Propylene Glycol—R. B. Kocher, Madison, Wis. No. 2,831,775.

Instant Milk Powder Made by Steaming Milk Solids to Form Agglomerates, Drying — Pet Milk Co., St. Louis. No. 2,832,686.

Cultured Cream Prepared by Ripening 16-20% Cream, Homogenizing, Chilling—National Dairy Products Corp., N.Y.C. No. 2,832,687.

Chewy Proteinaceous Gel Made From Protein Filaments by Adjusting pH, Heating—Lever Bros Co., N.Y.C. No. 2,833,651.

Potato Product Consisting of Fried Shredded Spuds Compressed Into a Mold—H. Sonnehein and B. J. Leet, Milwaukee. No. 2,833,654.

Fruit Juices and Concentrates Irradiated to Inactivate Enzymes, Micro-organisms — Raytheon Mfg. Co., Waltham, Mass. No. 2,833,657.

Flavored Milk Drinks Stabilized With Irish Moss Extractive—Seaplant Chemicals Co., New Bedford, Mass. No. 2,834,679.

Gelatin Rendered Cold-Water-Soluble by Contacting Solution With Liquid Dehydrating Agent, Precipitating Product, Separating — General Foods Corp., N.Y.C. No. 2,834,683.

Ice Cream Mix Containing Carboxymethyl Ether of Unhydrolyzed, Water-Soluble Dextran—Midland Chemical Corp., Dayton, Ohio. No. 2,834,684.

Ready-to-Eat Cereal Comprising Cooked Dried Particles of Rice and Corn That Are Coated With Uncooked High-Protein Flour, Rolled, Baked—Kellogg Co., Battle Creek, Mich. No. 2,836,495.

Food Dressing Comprising Vegetable Oil and Liquid Butterfat Emulsions, Inert Gas—H. M. Levin, Philadelphia. No. 2,836,497.

PROCESSING

Evaporating Water From Confections in High-Frequency Electric Field—C. Jamin, N.V., Rotterdam, Netherlands. No. 2,829,977.

Decolorizing Sugar Solutions by Digesting With Activated Carbon, Treating With Calcium Hypochlorite, Crystallizing—Sucro-Blanc, Inc., N.Y.C. No. 2,829,986.

Fractionating Starch Into Branched and Linear-Chain Components — Cooperatieve Verkoop-en Productieverenigning van Aardappelmeel en Derivaten "Avebe" G.A., Veendam, Netherlands. Nos. 2,828,987, 988, 989, 990.

Sterilizing Starch Granules With Ethylene Oxide—American Maize Products Co. No. 2,829,991.

Extracting Hops by Successive Ultrasonic Treatments, Boiling—Lueneberger Kronenbrauerei A.G., Lueneberg, Germany. No. 2,830,904.

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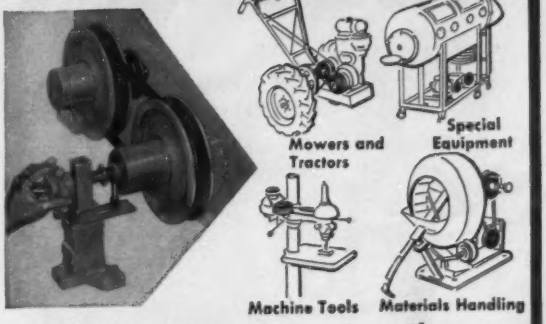

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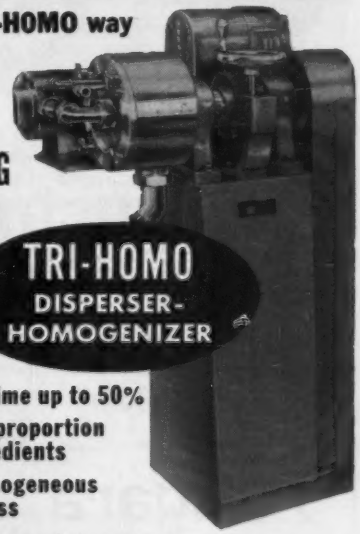

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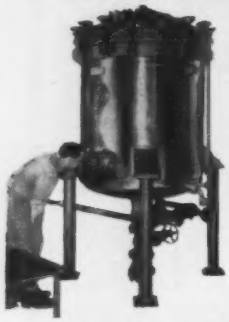

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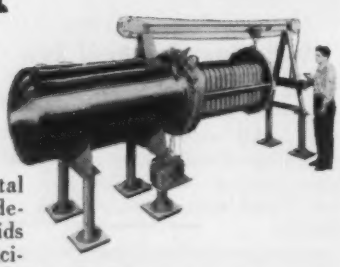

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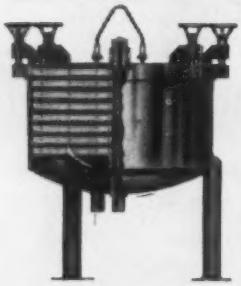

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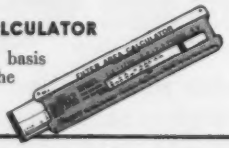

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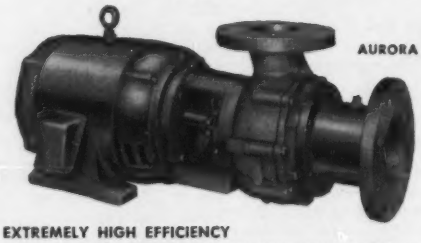

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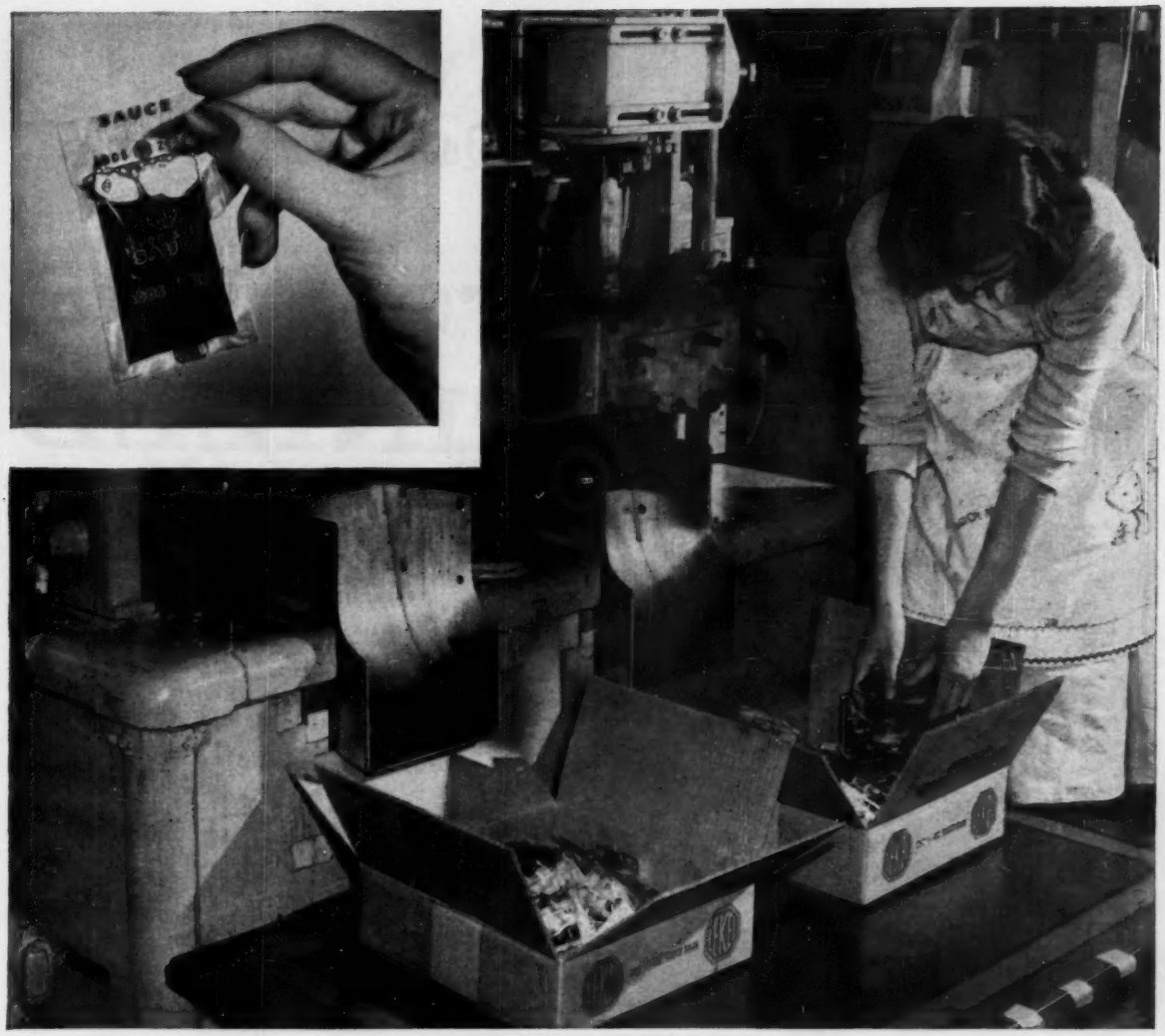

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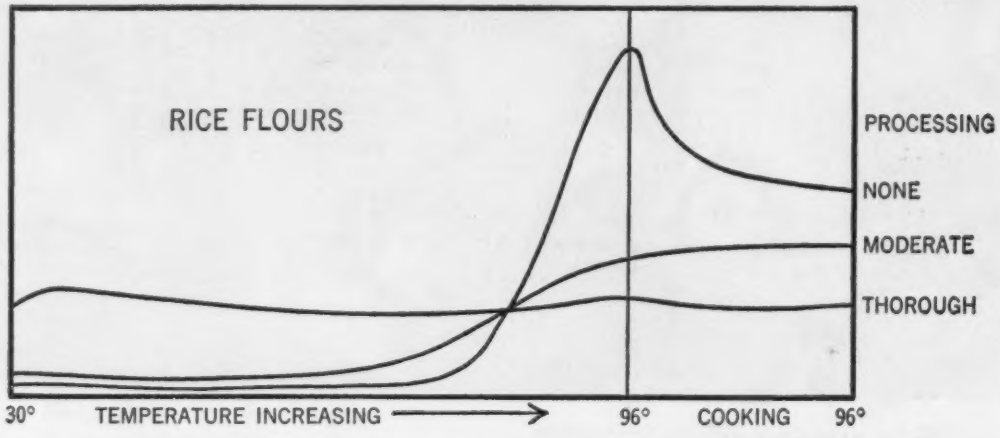

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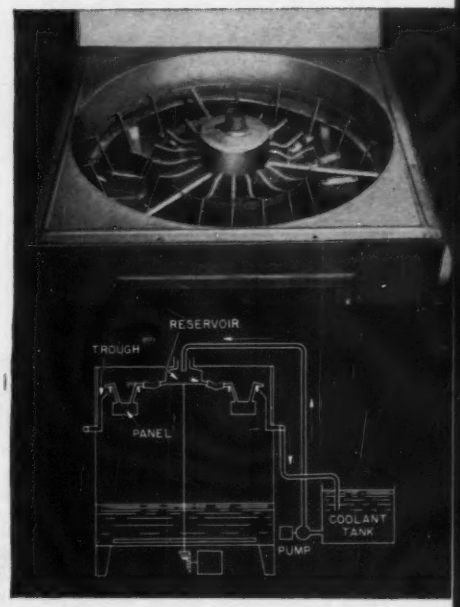

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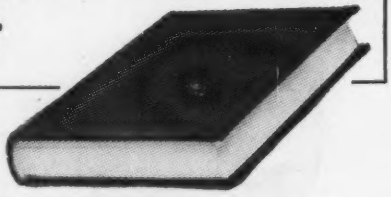

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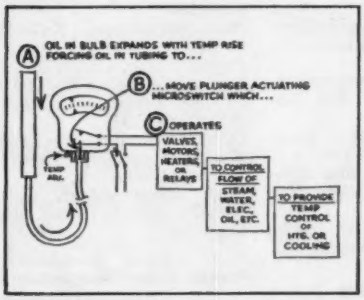
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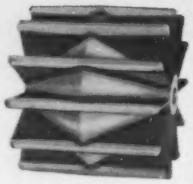

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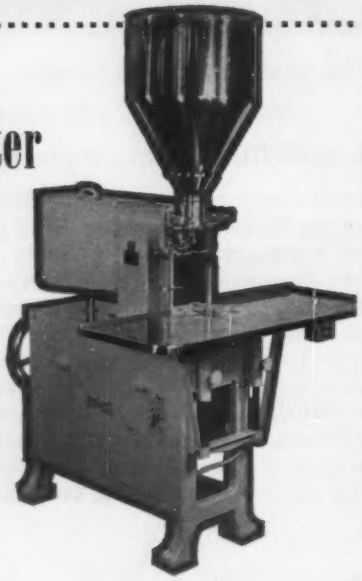

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